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Director General of Medical Affairs,
Imperial Japanese Navy.*

THE
SURGICAL & MEDICAL HISTORY
OF THE
NAVAL WAR BETWEEN JAPAN & RUSSIA
DURING
1904—1905.



Surgeon General. S. Kimura.

DIRECTOR GENERAL OF MEDICAL AFFAIRS,
IMPERIAL JAPANESE NAVY.

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SURGICAL & MEDICAL HISTORY

OF THE

NAVAL WAR BETWEEN JAPAN & RUSSIA

DURING

1904—1905.

BUREAU OF MEDICAL AFFAIRS,

Japan, NAVY DEPARTMENT.

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SURGEON GENERAL VISCOUNT SANEYOSHI, F. R. C. S.
 ENG. ETC., DIRECTOR GENERAL OF MEDICAL
 AFFAIRS, IMPERIAL JAPANESE NAVY, DURING
 THE WAR 1904-1905.



SURGEON GENERAL K. TOTSUKA, F. R. C. S. ENG.
 ETC., DIRECTOR OF SASEBO NAVAL HOSPITAL,
 DURING THE WAR 1904-1905.



SURGEON GENERAL S. SUZUKI, M. R. C. S. ENG.
 L.R.C.P. LOND. ETC., INSPECTOR OF MEDICAL
 AFFAIRS OF THE COMBINED FLEET
 DURING THE WAR 1904-1905.

PREFACE

The Russo-Japanese War, decidedly the greatest encounter the world ever witnessed, covers a period of time from the 6th of February, 1904, to the 15th of October, 1905. During this period the various reports brought forward by our naval medical officers in connection with the medical and sanitary affairs accumulated to such an enormous amount as would make a big volume not easy even to read through. We who are ordered to their compilation did our best in clearing away all complexities, and rest contented with giving out only the general summary of main facts.

Having lately published a volume entitled "The Naval Sanitary History of the Russo-Japanese War" written in Japanese and having made its distribution at home, we have now completed its English translation and have the pleasure of distributing the same abroad. We should be most happy if the work would prove of any use in furnishing material for future consideration in matters relating to the sanitation in war time.

March, 1911.

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THE SURGICAL AND MEDICAL HISTORY OF THE NAVAL WAR BETWEEN JAPAN & RUSSIA.

(1904-1905).

BOOK I. Sanitary Institutions and Principal Organs of Medical Administration.

CHAPTER I.

SANITARY INSTITUTIONS.

SECTION I. GENERAL REMARKS.

The central organ of medical and sanitary administration is the Bureau of Medical Affairs in the Naval Department under the control of the Minister of State for the Navy. In time of war, whenever the Imperial Headquarters come to be instituted, the Naval Medical Department is assigned a place on the staff, and stands at the head of all affairs connected with the medical and sanitary administration of shore stations and ships of the Navy.

When the war was declared on the 10th of February, 1904, and the Imperial Headquarters were located at the Imperial Court, Surgeon-General Baron Y. Saneyoshi, Chief of the Bureau of Medical Affairs, was appointed Chief of the Medical Department, and Fleet-Surgeon Y. Saito and Chief Apothecary, 1st class S. Takahashi, of the Medical Bureau, were appointed Councillors. As, however, the Affairs of the said Department had to be attended to at the Medical Bureau, Surgeon-Inspector S. Kimura and Fleet-Surgeon T. Yabe, of the Bureau, were taken into executive co-operation for war-time purposes.

SECTION II. SUPPLY OF MEDICAL STORES.

The medical instruments, drugs, and articles for consumption supplied by our Navy for the use of patients at the shore stations and on the ships of the Navy are prescribed and limited as to class and quantities corresponding to the full number of men on each station and ship, in accordance with the Regulations relating to the Management of Medical Stores; and when any demand is made for supplies over and above the prescribed number and quantity, such are granted by special permission. Here follow the supply tables of medical and surgical stores prescribed by the Regulations for Shore Stations and Ships of the Navy :—

TABLE A. FIXED ARTICLES.

(Articles supplied to vessels and shore stations, excluding destroyers and hospitals.)

Articles	Full Number		
	Less than 250 men	250 to 500 men	500 men and upward
General operating case .....No.	1	1	1
Operating case .....No.	1	1	1
Portable operating case ¹.....No.	1	1	2
Tooth forceps case .....Set	1	1	1
Tooth instrument case .....No.	1	1	1
Small ophthalmic instrument case .....No.	1	1	1
Microscope .....Complete Outfit.	One outfit each is provided on the Flag-ship of the Commander-in-Chief of the Standing Squadrons, at Secondary Naval Stations, and at Ominato Torpedo Division.		
Vaccination case.....No.	1	1	2
Ear, Nose and Throat case .....No.	1	1	2
Auriscopes .....No.	1	1	1
Nasal speculum .....No.	1	1	1
Rectum speculum .....No.	1	1	1
Silver catheter case.....Set	1	1	1
Tongue depressor (German silver).....No.	1	1	2
Irrigators.....No.	2	2	2
Dressing trays .....No.	3	3	3
Instrument trays for disinfection .....No.	3	3	3
Brass basins ² .....No.	3	3	3
Brass spittoons ³ .....No.	3	5	7
Sterilizer for instruments .....No.	1	1	1
Sterilizer for dressing materials .....No.	One outfit is provided on Battleships, 1st and 2nd class Cruisers, at Naval Barracks, Torpedo Divisions, and other shore stations having a complement of more than 250 persons.		
Dressing forceps .....No.	2	2	2
Bandage and dressing box.....No.	3	3	3

¹ Not provided in Port Offices, reserve ships, and Navy Yards (Kure Navy Yard excepted).

² In Naval Barracks 6.

³ In Naval Barracks 12.

Articles	Full Number		
	Less than 250 men	250 to 500 men	500 men and upward
Stretcher ¹ .....No.	1	2	4
Canvas chair .....No.	Provided in every vessel at the rate of one each in fighting tops, engine rooms, and boiler rooms, respectively.		
Nurse's Emergency bag ² .....No.	1	1	2
Portable Surgical bag ³ .....No.	1	1	2
Chatelaine with fittings .....No.	Provided at the rate of one outfit for every sickberth steward's mate and sickberth attendant.		
Water test case.....No.	1	1	1
Urine test case .....No.	1	1	1
Microscopic accessories, case.....No.	One outfit each is provided on the Flag Ship of the Commander-in-Chief of the Standing Squadrons at Secondary Naval Stations, and at Ominato Torpedo Division. One outfit each is provided in Naval Barracks.		
Spirometer .....No.	1	1	1
Dynamometer.....No.	1	1	1
Personal weighing machine .....No.	1	1	1
Balance ⁴ .....No.	1	1	1
Momme scale .....No.	1	1	1
Two grammes scale .....No.	1	1	1
Brass spoon .....No.	1	2	3
Iron spatula .....No.	2	2	2
Scissors for miscellaneous uses.....No.	1	1	1
Brass pitcher .....No.	1	1	2
Copper pan.....No.	1	1	1
Esmarch's bandage .....No.	1	1	1
Tourniquet .....No.	3	6	8
Glass bobbin .....No.	1	1	1
Hypodermic syringe .....No.	1	2	3
Tongue depressor of buffalo's horn.....No.	1	1	2
Clinical thermometer.....No.	4	4	6

¹ In Navy Yards 3. In Naval Barracks 8. ² In Gunnery School 2. ³ Not provided in Port Offices, reserve ships and Navy Yards (Kure Navy Yard excepted). ⁴ In Naval Barracks 2.

Article	Full Number		
	Less than 250 men	250 to 500 men	500 men and upward
Test figures on card board(Snellen) ...Set	1	1	1
Colored worsteds, Holmgren's series ...Set	1	1	1
Tape measure.....No.	1	1	2
Enema syringe, rubber.....No.	1	2	2
Rubber syringe ¹.....No.	2	3	4
Small rubber syringe ² No.	6	12	18
Truss (for inguinal hernia) .....No.	2	2	2
Razor strop.....No.	1	1	1
Liston's long splint .....No.	1	1	1
Wooden back leg splint .....No.	1	2	2
Mackintosh sheet for operating table ...No.	1	1	1
Rubber pillow.....No.	1	1	1
Operating gown .....No.	Provided at the rate of one outfit for every surgeon, head ward-master, chief s. b. steward, s. b. steward, s. b. attendant.		
Spoon (buffalo's horn) .....No.	2	3	3
Glass mortar .....No.	1	1	1
Glass pestle .....No.	1	1	1
Mortar, porcelain .....No.	1	2	2
Pestle, porcelain .....No.	1	2	2
Pill tile .....No.	1	1	1
Cork screw .....No.	1	2	2
Bottles for shelf.....No.	60	60	60
Ointment jars.....No.	6	6	6
Watering pot.....No.	1	1	1
Medicine chest for landing party(A)...No.	Two outfits each are provided in Secondary Naval Stations and Torpedo Divisions, one each on the Flag-ships of Command- ers-in-Chief of the Standing Squadrons ; In case of war or other emergency, it may be supplied wherever deemed requi- site.		
Medicine chest for landing party(B)...No.	One outfit each is provided at Secondary Naval		

¹ In Naval Barracks 5. ² In Naval Barracks 30.

Article	Full Number		
	Less than 250 men	250 to 500 men	500 men and upward
Medicine chest No. 1 .....No.	Stations, on Flag-ships of Commanders-in-Chief of the Standing Squadrons, at Naval Barracks, and Torpedo Division. In case of war or other emergency it may be supplied wherever deemed necessary.		
Medicine chest No. 2 .....No.	One outfit is provided on the Flag-ship of the Commander-in-Chief of the Standing Squadron. In case of war or any emergency, it may be provided wherever required.		
Medicine chest No. 3 .....No.	In case of war or other emergency, this is provided wherever required.		
Medicine chest No. 4 .....No.	Do.		
	Provided at every Torpedo Division and Secondary Naval Station at the rate of one outfit per torpedo-boat; one out fit each is also provided at every Signal Station.		

REMARKS.

At colleges and schools, the total number of the cadets or students and the full personnel of petty officers and men; at training stations the total number of the full personnel of petty officers and men and students are respectively considered as forming the complement.

At prisons and Navy Yards, the number of men mentioned in the first column is regarded as the complement.

On vessels carrying more than two surgeons, a Mackintosh sheet and a rubber-pillow are provided besides those mentioned in this table.

With tooth-forecps and silver catheters, respectively six pieces make a set. The Mackintosh sheet is, as a rule, 4 feet in length and 3 feet in width.

In case a microscope is to be supplied, it will be accompanied by a minute list of all its belongings.

CONSUMABLE ARTICLES.

Articles.	Annual Amount.									
	Less than 100 men	100 to 200 men	200 to 300 men	300 to 400 men	400 to 500 men	500 to 600 men	600 to 700 men	700 to 800 men	800 to 900 men	900 to 1000 men
Tumblers.....No.	2	2	2	3	3	3	4	4	4	5
Glass funnel.....No.	1	1	1	2	2	2	3	3	3	4
Tin funnel.....No.	2	2	2	2	2	3	3	3	3	4
10 grammes glass measure.....No.	2	2	2	2	2	3	3	3	3	4
200 grammes glass measures.....No.	2	2	2	2	2	3	3	3	3	4
△Sponge, surgical....No.	2	2	2	2	3	3	3	3	4	4
Double eye-shade, cloth.....No.	2	2	2	2	3	3	3	3	4	4
Single eye-shade, cloth.....No.	2	2	2	2	3	3	3	3	4	4
△Flexible wooden splint (large).....No.	5	5	5	10	10	10	15	15	15	20
△Flexible wooden splint (medium).....No.	5	5	5	10	10	10	15	15	15	20
△Flexible wooden splint (small).....No.	5	5	5	10	10	10	15	15	15	20
Felt.....Feet	6	6	6	8	8	8	12	12	12	16
Pads for wooden splints.....No.	2	2	2	4	4	4	4	4	4	4
×△Cotton cloth.....Tan.	30	50	70	90	110	125	140	155	170	185
△Lint.....Do.	1	1	2	2	3	3	4	4	4	10
×△Cotton wools....Momme*	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750
×△Absorbent cotton wools..... Momme	700	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500
×△Absorbent gauze...Tan	15	25	30	35	40	45	50	55	50	65
×△Gauze packages.....No.	40	60	60	100	120	140	160	180	200	220
First-aid packages...No.	The yearly amount is settled at the rate of the four packages for every bandage bag and one for every person of the landing party.									
Paraffin paper. ....Sheet	40	60	80	100	120	140	160	180	200	220
△White flannel.....Feet	6	6	6	12	12	12	18	18	18	24
×△Triangular bandages Sheet	10	10	10	15	15	15	20	20	20	25
△Silk ligature....Momme	2	2	3	3	4	4	5	5	6	6

* Momme is 3.75 grammes.

[illegible]

REMARKS.

At Naval Barracks, the total number of the full personnel of petty officers and men, recruits and the 2nd class boys; at colleges and schools, that of the cadets or students and the full personnel of petty officers and men; at training stations, the total number of the full personnel of petty officers, men, and students; at prisons, prisoners at the rate of three per every hundred of persons placed under each Naval Station, and at Navy Yards and Works, the number of the workmen and other employés are respectively regarded as the complement.

The annual amount of the consumable articles marked × which are to be supplied to shore stations or vessels, whose complement consists of over 1,000 men, is the sum mentioned in the 10th column plus the balance between the amounts mentioned in the 9th and 10th columns.

The yearly amount of the consumable articles marked △ to be supplied to works is the one generally apportioned, but all other articles in the same category, are to be supplied in the amounts given in the first column.

A *tan* of cotton cloth and of absorbent gauze measures 30 feet; a *tan* of lint 21 feet and a piece of chamois leather 1 foot square.

As to chamois leather in addition to the quantity mentioned in the above table, an extra piece for a set of portable operating case is supplied; only in this case, the leather measures not more than half a *shaku*¹ in length.

A sheet of oiled paper is 2.3 feet long and 2.1 feet wide. The rubber tubes provided are of three kinds as to their size; that is, large, middle, and small. Litmus papers, both red and blue, are supplied in quantities as required, put up in glass bottles.

The gauze packages consist of three pieces of absorbent gauze each one foot square, which is enveloped in a sheet of paper varnished with *shibu* (the juice of unripe persimmon) and subjected to steam disinfection.

The first-aid packages are of two kinds. One, intended for the use of landing parties, consists of three sheets of 1‰ corrosive sublimate gauze 1½ feet square, enveloped in *shibu* paper and sealed with paste, and wrapped around with a piece of a triangular bandage, all of which put in a bag of gummed

¹ Shaku = a Japanese foot, equal to .944 English foot.

calico, which is finally fastened with a couple of safety pins. The other kind consists of three sheets of 1%₁₀₀ corrosive sublimate gauze 1 foot square, enveloped in *shibu* paper and sealed with paste. To this are attached a piece of triangular bandage and a safety pin, which all are again enveloped tightly with paper of the same kind. This kind of packages, when found to have been reduced in antiseptic quality, is subjected to repairs at the medical dépôt.

Leaches are called by their number, and ice by the *kin* (pound).

DRUGS.

Articles	Annual Amount										
	Less than 100 men	100 to 200 men	200 to 300 men	300 to 400 men	400 to 500 men	500 to 600 men	600 to 700 men	700 to 800 men	800 to 900 men	900 to 1000 men	Amount in a receipt
×△Acidum boricum...Gramme	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,500	4,950	225 450
×△Acidum carbolicum.....Do.	2,250	4,500	6,750	9,000	11,250	13,500	15,750	18,000	20,250	22,500	450 225
×Acidum hydrochloricum dilutum .....Do.	450	900	1,350	1,800	1,800	2,250	2,250	2,700	2,700	3,150	450
Acidum nitricum.....Do.	28	56	56	56	84	84	84	112	112	140	28
×△Acidum picricum.....Do.	56	84	112	140	168	196	224	252	280	308	28
×△Acidum salicylicum.....Do.	56	112	168	168	224	224	280	280	336	392	56
×△Acidum tannicum.....Do.	28	28	56	56	84	84	112	112	140	196	28
×Alumen .....Do.	225	450	675	675	900	900	1,125	1,125	1,350	1,575	225 450
×Phenazonum.....Do.	56	112	168	224	280	336	392	448	504	560	56
×△Aqua destillata.....Do.	1,350	2,250	3,150	4,050	4,950	5,850	6,750	8,100	9,000	9,900	450
×Aqua Laurocerasi .....Do.	450	675	900	1,350	1,575	1,800	2,250	2,475	2,700	2,925	225 450
Argenti nitras fusus.....Do.	28	28	56	56	56	84	84	84	112	168	28
Atropinae sulphas .....Do.	1	1	1	1	1	1	1	1	1	1	1
×Balsamum peruvianum.....Do.	225	225	225	225	225	225	450	450	450	450	225
×Bismuthi subnitras.....Do.	450	675	900	1,125	1,350	1,575	1,800	2,025	2,250	2,250	225 450
Camphora.....Do.	56	56	112	112	112	168	168	168	224	336	56
Quininae hydrochlori- dum .....Do.	112	224	336	448	560	616	672	728	840	980	28
Chloroform.....Do.	112	112	224	224	336	336	448	448	560	672	112

Articles	Annual Amount										
	Less than 100 men	100 to 200 men	200 to 300 men	300 to 400 men	400 to 500 men	500 to 600 men	600 to 700 men	700 to 800 men	800 to 900 men	900 to 1000 men	Amount in a receptacle
×△Cocainae hydrochloridum.....Gramme.	2	4	4	6	8	8	10	12	12	14	2
×△Gum plaster. ....Feet.	12	24	36	48	60	72	84	96	108	120	3
Extractum filicis..... .....Gramme.	28	28	28	28	28	28	28	28	28	28	28
Extractum gentianae....Do.	225	225	225	225	225	450	450	450	450	450	225 450
Extractum ergotae.....Do.	28	28	56	56	56	84	84	84	112	140	28
×△Glycerinum.....Do.	450	900	900	1,350	1,350	1,800	1,800	2,250	2,250	2,700	450
Acaciae gummi.....Do.	112	112	224	224	336	336	448	448	560	896	112
×△Corrosive sublimate with salt.....Do.	225	225	225	225	450	450	450	675	675	675	225
×Hydrargyri subchloridum.....Do.	112	112	224	224	224	336	336	448	448	560	112
×Hydrargyri salicylas....Do.	28	56	84	112	112	140	140	168	168	196	28
×△Iodoformum.....Do.	112	112	224	224	336	336	448	448	560	672	112
×Potassii bromidum.....Do.	225	225	450	450	450	675	675	675	900	1,125	225 450
×Potassii chloras.....Do.	1,350	2,250	3,150	4,050	5,400	6,300	7,200	8,550	9,450	10,350	450
×Potassii iodidum .....Do.	900	1,350	2,250	2,700	3,600	4,050	4,950	5,400	6,300	6,750	450
×Potassii nitras .....Do.	225	225	225	450	450	450	675	675	675	900	225 450
Potassii permanganas...Do.	28	28	28	56	56	56	84	84	84	140	28
Cresoti carbonas.....Do.	56	84	112	140	168	196	224	252	280	420	28
Liquor ferri perchloridi.. .....Do.	112	112	112	224	224	224	336	336	336	560	112
×Magnesii sulphas.....Do.	1,800	3,150	4,500	5,850	7,200	9,000	10,350	11,700	13,050	14,400	450
×Morphinae hydrochlori- dum .....Do.	2	4	6	8	8	10	12	14	16	18	2 4
×Sodii bicarbonas.....Do.	2,250	3,600	4,950	6,300	7,650	9,000	10,350	11,700	13,050	14,400	450
×Sodii salicylas.....Do.	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,500	4,950	450
Theobromatis oleum.....Do.	225	225	225	225	225	450	450	450	450	450	225
×Oleum ricini.....Do.	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,500	4,950	450
×△Oleum sesami.....Do.	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,500	4,950	450
×△Plumbi acetas.....Do.	225	225	225	450	450	450	675	675	675	900	225

Articles	Annual Amount										
	Less than 100 men	100 to 200 men	200 to 300 men	300 to 400 men	400 to 500 men	500 to 600 men	600 to 700 men	700 to 800 men	800 to 900 men	900 to 1000 men	Amount in a receptacle
×Pulvis ipecacuanhae compositus.....Do.	112	112	336	448	560	560	672	672	784	784	112
×Liquorice root pulverised.....Do.	56	56	112	112	168	168	224	224	280	280	56
×Saccharum lactis.....Do.	225	225	225	450	450	450	675	675	675	675	225
Santoninum.....Do.	4	8	12	16	16	20	20	24	24	32	4 8
×Sinapis pulvis.....Do.	200	400	400	600	600	800	800	1,000	1,000	1,000	200
×Alcohol.....Do.	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,500	4,950	450
Alcohol with methyl alcohol.....Do.	2,700	4,050	5,400	6,750	8,100	9,450	10,800	11,700	12,600	13,500	450
×Spiritus vini gallici.....Do.	650	650	650	650	1,300	1,300	1,300	1,300	1,950	1,950	650
×Spiritus aetheris nitrosi.....Do.	450	900	1,350	1,800	2,250	2,250	2,700	2,700	3,150	3,150	450
×Spiritus ammoniac aromaticus.....Do.	225	225	450	450	675	675	900	900	1,125	1,125	225 450
×Spiritus camphorae.....Do.	450	900	1,350	1,800	2,250	2,250	2,700	2,700	3,150	3,150	225 450
×Spiritus menthae piperitae.....Do.	112	112	224	224	224	336	336	336	448	448	112
Sulphonal.....Do.	28	28	56	56	56	84	84	84	84	112	28
×Tinctura amara.....Do.	2,700	4,950	7,200	9,450	11,700	13,500	15,300	17,100	18,900	20,700	450
Tinctura digitalis.....Do.	112	112	112	224	224	224	336	336	336	448	112
×Tinctura iodi.....Do.	225	450	675	900	900	1,125	1,125	1,350	1,350	1,800	225 450
×Tinctura ipecacuanhae.....Do.	225	450	675	900	900	1,125	1,350	1,575	1,800	1,800	225 450
×Tinctura opii.....Do.	112	224	336	448	448	560	560	560	672	672	112
×Tinctura nucis vomicae. .....Do.	112	112	224	224	336	336	336	448	448	448	112
×Opium tabloid.....No.	50	50	100	100	150	150	200	200	250	250	50 100
strychnine nitrate tabloid.....No.	40	40	40	40	40	80	80	80	80	120	40
×Unguentum hydrargyri.....Gr.	225	225	450	450	675	675	900	900	1,125	1,125	225 450
×Unguentum vesicans...Do.	56	56	56	56	56	112	112	112	112	112	56
×Vaseline.....Do.	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,050	4,950	450
×Zinci oxidum.....Do.	112	224	336	448	448	560	560	672	672	672	112
×Zinci sulphas.....Do.	225	225	450	450	675	675	900	900	1,125	1,125	225 450

REMARKS.

At Naval Barracks, the total number of the full personnel of petty officers and men, recruits and 2nd class Boys ; at colleges and schools that of the cadets and the full personnel of petty officers and men ; at training stations, the total number of the full personnel of petty officers and men and students ; at prisons, prisoners at the rate of 3 per cent. of persons put under each Naval Station ; and at Navy Yards and Works, the actual number of the employés, are respectively regarded as the complement.

As far as the medicines marked x are concerned, the total annual supply is capable of increase, in proportion to the number of men. At shore stations or on vessels whose complement are above 1,000 but below 1,100, the amount to be supplied is the sum mentioned in the 10th column added by that of the 1st column ; in case the complement is more than 1,100 but less than 1,200, the amount to be supplied is the sum mentioned in the 10th column increased by that of the 2nd column ; and this ratio of increased supply is to be carried on to any number of increase in the complement.

As far as the medicines marked Δ are concerned, works are supplied the ordinary annual amounts, while other medicines are yearly supplied in the amounts mentioned in the 1st column.

Atropinae sulphas, cocainae hydrochloras, morphinae hydrochloras and Dover's powder may be supplied in the shape of lozenges.

In measuring quantities, vaccine virus is reckoned by sets, and anti-serum and serodiagnostic fluids for typhoid fever by bottles.

CHEMICALS AND REAGENTS.

Articles	Annual Amount	Amount in a receptacle
Sulphuric acid .....Gramme	60	60
Starch (Amylum) .....Do.	20	20
Copper sulphate .....Do.	30	30
Potassium iodide .....Do.	30	30
Liquor potassae .....Do.	120	60
Nessler's reagent .....Do.	60	30

Article	Annual Amount	Amount in a receptacle
Solution of ammonium oxalate .....Do.	60	30
Solution of silver nitrate with nitric acid.....Do.	120	30
Solutio barii chloridi cum acido .....Do.	60	30
Solution of brucine sulphate.....Do.	60	30

ARTICLES SUPPLIED TO DESTROYERS.

FIXED ARTICLES.

Articles	Full number	Articles	Full number
Operating case .....No.	1	Tourniquet .....No.	1
Vaccination case.....No.	1	Hypodermic syringe ...No.	1
Auriscope .....No.	1	Clinical thermometer ...No.	2
Silver catheter case.....Set	1	Tape measure.....No.	1
Tongue depressor (German silver) .....No.	1	Enema syringe, rubber. No.	1
Dressing trays.....No.	1	Rubber syringe .....No.	2
Disinfection basin .....No.	1	Small rubber syringe...No.	3
Brass basin.....No.	1	Razor stop.....No.	1
Bandage and dressing box .....No.	3	Operation gown .....No.	1
Water test case, small. No.	1	Glass mortar .....No.	1
10 gramme scale .....No.	1	Glass pestle.....No.	1
Brass spoon.....No.	1	Pill tile .....No.	1
Iron spatula .....No.	1	Cork screw .....No.	1
Scissors for miscellaneous use .....No.	1	Bottles, shelf. ....No.	24
Brass piteher .....No.	1	Ointment pots. ....No.	2

CONSUMABLE ARTICLES.

Articles	Full number	Articles	Full number
10 gramme glass measure ...No.	1	Flexible wooden splint (small).....No.	4
200 gramme glass measure...No.	1	Cotton cloth .....Tan	4
Flexible wooden splint (large)No.	3	Cotton cloth roller bandages. No.	20
Flexible wooden splint (medium) .....No.	3	Absorbent cotton wools Momme	500

Articles	Full number	Articles	Full number
Absorbent gauze <i>Tan</i>	10	Litmus paper .....Bundle.	2
Gauze packages..... <i>No.</i>	30	Brushes for external applica- tion <i>No.</i>	8
First aid packages <i>No.</i>	10	Square paper for powder. Sheet	400
• Paraffin paper <i>No.</i>	25	Paper sacks for medicine ... <i>No.</i>	50
Silk threads <i>Momme.</i>	2	Medicine bottles <i>No.</i>	5
Triangular bandages..... <i>No.</i>	5	Corks <i>No.</i>	20
Pins..... <i>No.</i>	100	Ointment box <i>No.</i>	10
Chamois leather <i>No.</i>	1	Drop tubes..... <i>No.</i>	3
Ice caps <i>No.</i>	2	Medicine cards .....Sheet	50
Oil paper <i>No.</i>	6	Cards for medicine bottles ... <i>Do.</i>	50
Medicine cups..... <i>No.</i>	3	Soap..... <i>No.</i>	12
Test tubes <i>No.</i>	6	Nail brush..... <i>No.</i>	2
Test tube brushes <i>No.</i>	1	Towels..... <i>No.</i>	4

DRUGS.

Articles	Annual amount	Amount in one receptacle
Acidum boricum .....Gramme	675	225
Acidum carbolicum..... <i>Do.</i>	1,350	450
Acidum hydrochloricum dilutum ... <i>Do.</i>	225	225
Acidum picricum <i>Do.</i>	56	28
Acidum salicylicum..... <i>Do.</i>	56	56
Aqua destillata <i>Do.</i>	900	450
Argenti nitras fusus <i>Do.</i>	28	28
Balsamum peruvianum <i>Do.</i>	225	225
Adhesive plaster, rubber .....Feet	6	3
Potassii chloras .....Gramme	450	450
Magnesii sulphas..... <i>Do.</i>	450	450
Pilula quinae <i>No.</i>	560	280
Alcohol .....Gramme	450	450
Spiritus vini gallici <i>Do.</i>	325	325

Articles	Annual amount	Amount in one receptacle
Spiritus ammoniac aromaticus. Gramme.	225	225
Spiritus camphorae .....Do.	225	225
Tinctura amara .....Do.	540	450
Tinctura iodi .....Do.	225	225
Trochiscus antipyrinae.....No.	120	60
Trochiscus atropinae.....Do.	20	10 20
Trochiscus bismuthi.....Do.	300	100 200
Trochiscus cocainae .....Do.	400	20
Dover's powder tabloid .....Do.	240	30 60
Trochiscus hydrargyri subchloridi ...Do.	100	20 100
Trochiscus potassi iodi .....Do.	400	200
Trochiscus morphinae .....Do.	100	50
Trochiscus sodii salicylatis .....Do.	200	50 100
Stomachic tabloid .....Do.	2,000	250 500
Unguentum hydrargyri .....Gramme	112	112
Vaselin .....Do.	450	450
Zinci oxidum .....Do.	112	112
Zinci sulphas .....Do.	112	112

CHEMICALS AND REAGENTS.

Articles	Annual amount	Amount in one receptacle
Dilute sulphuric acid .....Gramme	30	30
Starch .....Do.	20	20
Potassium iodide.....Do.	30	30
Nessler's reagent.....Do.	30	30
Solutio argenti nitrici cum acido...Do.	60	30

The Bureau of Medical Affairs makes a due distribution of the annual amount it receives from the government for its current expenses among the Naval Hospitals; and the Medical Depôts of the respective hospitals make purchases and supply of medical stores, in pursuance of prescribed rules, not only for the hospitals themselves, but for all the ships and shore stations on the respective Naval Stations; besides keeping in store additional stocks for cases of emergency. But the allowances for current expenses are limited; and therefore, being unable to make sufficient provision, we aim at keeping in store just such an amount of stock as will be sufficient to meet the demand for the time, any deficiencies that may occur being made good by purchases out of Extraordinary Expenses.

In the present emergency of the war, it was decided that the ships and vessels leaving for the front should have an additional supply amounting to one-third of their annual supply, and that the annual amounts of drugs and consumable articles required for the treatment of wounds should be doubled. It happened, however, that only a small number of our vessels were collected at Kure, and that by far the greater number were gathered together at Sasebo. The consequence was, that the Sasebo Medical Depôt ran its stores very low. Such deficiencies were made good by transferring to Sasebo portions of the stores kept in the Yokosuka and Maidzuru Medical Depôts just to meet the urgent demands of the time. Then, later, when we had obtained a share of the Extraordinary War Expenses, due distribution of money was made according to circumstances among the Medical Depôts so as to enable them to meet the demands made on them from time to time, the supplementary medical stores, being taken on transports to the front in order to meet the demand from various ships and vessels directly as occasion arose.

For regular stocks a new channel was opened through which any supplementary supplies, even over the fixed amount, might be obtainable without the formalities required in ordinary times.

Provision also was made for the supply, in any required amounts, of any articles not included in the supply table which might be deemed necessary.

Totsuka stretchers were supplied to all ships, fresh distributions were made of Michel suture sets, seissors, large-sized parcels of gauze packages etc., the supply

of splints, drugs etc., was thoroughly overhauled and renovated, and obsolete or timeworn articles discarded.

SECTION III. PATIENTS' EXPENSES.

The following is a list of the special expenses required for the war of 1904—5 :—

1. Expenses for the purchase of medical stores and consumable articles for extraordinary additional supplies made by special order or sanctioned by authorities.

2. Expenses for the purchase of medical stores, consumable articles and equipments for patients to supplement the stocks issued.

3. Cost of receptacles proportionate to the increase of medical stores.

4. Wages paid to instrument-repairers, store-keepers, laundrymen, hired coolies etc.

5. Expenses for additional allowances, pursuant to Rules for Special Allowances for the Navy in War Time.

6. Cost of transportation specially increased.

7. Expenses for the special increase of patients entrusted to private practitioners and civil hospitals.

8. Expenses for disinfection against contagious diseases.

Of the above items of expenses, the 1st and 2nd reached the highest figures. The purchase of such things as bedsteads and accessories requisite for the accommodation of the increased number of patients estimated for during the war time in each hospital, came under the first item, which was thereby suddenly inflated. This item of expense amounting to *yen* 57,173 was received during the initial stage of the war.

All items of expenses below the 2nd, being what might be called expenses for the maintenance of war, were received month after month according to the estimates made for each month. These were, therefore, termed “Monthly Current Expenses”. At the beginning of the war it was very difficult to make such estimates; but we made our calculations on the basis of the estimates for ordinary times, the amount of increase in the number of fleets and fleet auxiliaries and

their personnels, and, taking due warning from what we had experienced in the China-Japanese War, estimated the yearly amount at *yen* 123,561, i. e. 10,295.75 per month. When this is compared with the yearly estimate of current expenses for patients for the preceding year (1903), which is *yen* 126,931.887, it will be seen that the two amounts are just about the same. But by the time that Port Arthur had fallen (Jan. 1905) and that the Port Arthur Naval Station had been created, followed by the establishment of the Port Office, Submarine Mining Corps, Naval Arsenal, Naval Hospital, etc., the monthly current expenses to be defrayed out of the Extraordinary War Expenses for Patients necessarily increased until they reached a total of *yen* 12,299. With the exception, however, of *yen* 6,000 for the supplementary supply of medical stores to make good the loss by the earthquake in the Kure Naval Hospital in May, 1905, and of *yen* 1,500 disbursed in two instalments, Jan. 1906 and Jan. 1907, for establishing the Temporary Naval Briquette Factory, we were able to meet the monthly disbursements with the above estimated amount, until the conclusion of peace. Now if we calculate the Extraordinary War Expenses for Patients and the Current Expenses for the same, disbursed during the period from Jan., 1904 to Dec., 1905 (the period during which the demand on current expenses was most urgent), we find that our expenditure stood at *yen* 308,750 out of Extraordinary War Expenses, and about *yen* 259,000 out of the Current Expenses, together making *yen* 567,750.

As we afterwards made further disbursements out of "Extraordinary War Expenses" for the restoration or otherwise of medical outfits, reserve stores etc., an addition of *yen* 24,472 was made to the above sum of *yen* 308,750; so that the total disbursements came up to *yen* 333,222. The monthly disbursements made from Jan. 1904 until the final disbursements out of the Extraordinary War Expenses in Feb., 1907, for temporary and monthly current expenses are as shown below:—

The same are shown below as distributed among the naval stations:—

Yokosuka Naval Station.....	<i>yen</i> 40,271.706
Kure Naval Station	„ 74,361.559
Sasebo Naval Station	„ 184,554.300

**TABLE SHOWING THE MONTHLY DISBURSEMENTS OF EXPENSES
OF PATIENTS OUT OF "EXTRAORDINARY WAR EXPENSES."**

Year.	Month.	* 5,000	10,000	15,000	20,000	25,000	The disbursement.
1904	January.						Ym.
	February.						4,045.582
	March.						17,839.304
	April.						9,965.577
	May.						14,335.535
	June.						13,594.746
	July.						9,510.203
	August.						7,259.347
	September.						23,168.496
	October.						16,915.527
	November.						16,251.753
	December.						12,493.764
1905	January.						11,975.290
	February.						14,564.420
	March.						12,506.445
	April.						14,501.162
	May.						16,120.900
	June.						8,721.195
	July.						17,662.270
	August.						13,282.912
	September.						10,836.728
	October.						13,113.670
	November.						12,234.142
	December.						11,479.580
1906	January.						6,371.755
	February.						6,398.285
	March.						8,594.300
	April.						6,450.937
	May.						1,144.440
	June.						215.980
	July to December.						638.780
	February to May.						1,029.110
1907							
Total							333,222.135

* Each one square corresponds to Y. 100
and the red part shows the disbursements.

Maidzuru Naval Station.....yen	28,468.778
Port Arthur Naval Station..... „	4,570.652
Naval Briquette Factory..... „	995.140
Total..... „	333,222.135

The above disbursements arranged under different items run as under :

Expenses for	Medical Outfits*.....yen	152,059.151
	Drugs	„ 67,963.053
	Storage and Transport of Stores	„ 12,967.496
	Sick Room Equipments..... „	92,195.939
	Disinfection against Contagious Diseases „	2,193.540
	Entrusted Patients	„ 5,842.956
	Total	„ 333,222.135

SECTION IV. PREPARATION FOR THE ADMISSION OF PATIENTS.

We have adopted it as our ordinary policy that the hospital at each Naval Station should open its provisional ward in times of emergency and enlarge its capacity for admission of the sick and wounded patients. With this end in view the Chief of the Medical Bureau determined, prior to the present emergency, the extent to which the capacity of each hospital could be enlarged by a careful consideration of the locality and the direction which the line of battle might reasonably be expected to take, and gave orders that each hospital should make due preparation for opening its provisional wards. He also devised a plan for transferring patients from one hospital to another whenever a hospital should become overcrowded with patients. At Sasebo where ships and vessels were collected before the outbreak of hostilities, it was considered that the hospital would soon get more than full of patients. Provision was consequently made that the in-patients there should be transferred to Kure or other hospitals on any ships that might chance to be bound to those ports, in order that the Sasebo Naval Hospital might at all times have room left for further admissions. And further, two ships *Kobe Maru* and *Saikiō Maru* were fitted out as hospital ships according to a premeditated plan, and were assigned the duty of receiving

* This includes all medical stores with the exception of drugs.

and carrying back the sick and wounded from the front. Also the transport vessels carrying medical officers were equipped ready for the reception and sending back of a small number of patients.

The Takeshiki Sick Quarters were organized after a Naval Hospital, with increased accommodation for the admission and treatment of the sick and wounded who might not properly belong to its charge, equally with those under its charge.

And when Port Arthur came into our possession, a Naval Hospital was established there for the reception and treatment of patients in that quarter.

SECTION V. GENERAL DIRECTION FOR THE TREATMENT OF WOUNDS.

With respect to the treatment of wounds it goes without saying that the aseptic system should be followed as far as possible as a guiding principle. But seeing that it might be found almost impossible to stick absolutely to the above system in practice on board ships in action, and seeing that the wounds themselves would have in most cases to be treated as soiled from the beginning, the Bureau of Medical Affairs with the desire of following either antiseptic or the aseptic method as the case may be, according to circumstances of time and the nature of wounds, made provisions of medical stores to suit both cases.

In Jan., 1904 prior to the declaration of war the Chief of the Bureau of Medical Affairs, Baron Saneyoshi, made a tour of inspection at Sasebo, visiting not only all the shore offices but also the fleet and fleet auxiliaries collected in the harbour at the time, in order to see into the condition of equipments of the dressing stations on board the ships and the actual conditions under which the medical officers were working. And prior to the departure of the fleet for the front, he summoned all medical officers from both ships and shore stations to the Naval Hospital at Sasebo, and made a long statement, the gist of which was as follows :—

“ The Location of the Dressing Stations.—On battle-ships and first class cruisers I find the dressing stations situated, as they should be, in some well-protected quarter of the lower or main deck, but on some of the ships the location assigned is in a place that has been dirtied and soiled by daily use, with more or less of offensive odour attaching to it. Such places I hold it desirable to have thoroughly

cleaned or, if possible, that a better places should be found elsewhere. I also find on other ships that it is located lower down, near the bottom of the vessel. Such a position may be much less exposed to danger from shells, but the trouble of conveying the patients is so great that I wish for further consideration of the question. In second class cruisers and other vessels of smaller type, the dressing station is invariably situated in a locality ill-protected and unsafe; but this is an inevitable and natural consequence of the construction of these vessels. Make it a rule, therefore, in such vessels to remove the patients as soon as treated to some place of comparatively greater safety.

“A word also to the medical officers. Place yourselves under cover and avoid all danger as far as possible, whenever you have no wounded under your care.

“Operating Table.—In some ships a wooden table is fixed to the wall of the dressing station. There is nothing objectionable in this, if it be only for temporary use during the engagement; but it may be very inconvenient, and it is advisable to have it changed for an iron stand at an early opportunity.

“Lighting of the Dressing Stations.—Every dressing station is, I think, sufficiently well lighted with electric lamps; but I think it necessary to have candles provided against the sudden extinction of electric lights should the motor engine or wires be damaged. It is quite satisfactory that the *Asama* has acetylene lamps provided.

“Ventilation.—It is a matter of regret that the dressing stations placed on the lower deck—especially those placed down below the lower deck—are very imperfectly ventilated; but as this may be a matter unavoidable, I simply desire the medical officers to pay particular attention to this point.

“Water-supply.—Water-supply is insufficient without the fixture of a water cistern or water pipes with stop-cocks near the dressing station; and I deem it necessary to have them provided at the first opportunity. The *Asahi* had a *sake* barrel (with a capacity of 16 gallons) filled with water that had been boiled. This is just one degree better than having a bucket only. If it is impossible at this crisis to make a special construction of water pipes, it is advisable to follow the *Asahi's* example.

“Transportation of the Wounded.—The stretcher after design by Surgeon General K. Totsuka is considered practical and may be used in general. The canvas stretcher made after the four-tailed stretcher designed by Surgeon Inspector S. Kimura, which is kept in some ships, is deemed of much advantage and help in bare-hand transportation. The mode of transportation from an engine-room seems clumsy and requires further practice.

“In transporting the wounded on torpedo-destroyers, and the like, the bare hand method may be resorted to: but in transporting them from an engine-room and the like, it is considered safer to employ Totsuka stretcher. Such stretchers are, therefore, to be kept in store.

“In transferring patients into boats, the stretcher will be of much advantage, as also field stretchers with straps attached for chest, thighs and legs.

“Receiving Place for the Wounded after First-aid.—The wounded after treatment must be transferred to a safer place. In ships of a class above 1st class cruiser it is quite right that a suitable place should be chosen for this purpose; but in other ships of a smaller type it is a matter of regret that we have been unable to procure a proper location. I quite agree with the Captain of the *Yoshino* who proposed to have it at a place near the entrance to the store-room below the lower deck. I cannot but ask for further consideration of this subject by all the ships.

“The Mortuary.—It is but proper that every ship should appropriate its bath-rooms to this purpose, provided that all dead bodies be wrapped up immediately in blankets or hammocks, as otherwise, the flow of blood on the deck may impede the combatants. Some thirty pieces of blankets kept for this purpose on the upper and lower decks, as is done in some ships, seem to be the best provision for this case.

“How to stop Bleeding.—When there is much bleeding, make the ambulance men stop it at once by applying compresses and bandages to the wounded part; and only when bleeding is copious, apply the tourniquet of rubber tubing. This is the method that all the ships are agreed upon, and I give my consent, but care must be taken that the binding with rubber tubes shall not continue for more than an hour or two.

“What the ambulance men have mainly to do is to carry the wounded quickly to the dressing station; they should not touch the wound if it can be helped.

“How to dress a wound.—All ships are agreed on having the wound dressed with steam-sterilized gauzes and I, too, am agreed. Some propose to wash the wound with a solution of corrosive sublimate or with sterilized water. But for recourse in the midst of battle it would be a better plan to sprinkle over the wound an antiseptic powder composed of boracic acid and salicylic acid or the like, and apply to it dry sterilized gauzes, so as to close up the wounds as quickly as possible. Washing the opening of the wound, etc., might cause trouble unless there is plenty of time during which to do it.

“How to treat burns.—It is a good idea to apply pierie acid solution to a not very extensive burn, and to extensive burns sesame oil, vaseline mixed with borax, etc. Some have proposed to apply an ointment composed of bismuth oxynitrate, boric acid, lanoline, and olive oil. This may be tried with advantage.”

On March 3, when a distribution of Michel suture sets was made among all the ships and vessels, the Bureau of Medical Affairs issued a pamphlet giving an explanation of their use.

“It is a matter of course (it said) that the wounds inflicted in naval battle should be generally of a severe nature and should mostly take a worse course than others. Common wounds inflicted by bullets in field engagement are now-a-days assuming less dangerous character, showing a tendency to grow something like punctured wound made by a sharp pointed weapon—the opening being quickly closed up by the coagulated blood so as to turn into a subcutaneous wound. In this way, most of them heal by primary union. In short, the fate of a wound depends upon its being hermetically sealed against the intrusion of virus from outside; so that it is of utmost importance, as first-aid, to seal up the wounds in the skin as quickly as possible, so as to prevent the virus from entering.

“The Michel suture sets, now being distributed, can easily be disinfected and enable the surgeon to seal up in a moment the opening of a wound, and is therefore likely to be of very great value during action. A small wound, such

as one made by a bullet, may be converted at once, by a single application of the wound clamps, into a subcutaneous one. A trial is strongly recommended.

“ It is to be feared that most of the wounds inflicted in action are already soiled before they are brought under the hand of a medical officer. It too frequently happens that a wound like that inflicted by a bullet contains in it a piece of cloth; and unless this piece is perfectly sterile, such a wound cannot be scientifically aseptic. How much more so must it be with the wound inflicted by an irregular-shaped fragment of a shell. But the virus that might chance to enter into a small wound like that caused by a bullet, is commonly so insignificant in quantity that it is washed out by the flowing blood or else killed within the wound. Hence, supposing the wound after infliction to have been protected from bacilli, there ought to be no obstruction to its healing by primary intention. This is a fact recently proved with bullet wounds. Of course, instances of bullet wounds cannot be quoted to illustrate the case of shell wounds inflicted in naval battles. It is quite evident that the larger and more irregular-shaped the fragments of shells, the larger will be the pieces of cloth that may get into the wound, and the greater will be the number of bacilli, that may enter at the same time. And it may be the case with most of such wounds that the tissues around the wound track being considerably crushed and bruised and their vitality being enfeebled, liability to suppuration comes in at the very time of receiving the wounds. As first-aid, therefore, as has already been remarked, either antiseptic or aseptic treatment may be resorted to according to the nature of the wounds. But with a wound of moderate size and that can be readily stitched, to close it up against the intrusion of any virus that may lie on the skin around the wound, should be in most cases I believe, the principal thing to be done in order to prevent suppuration.”

The above-mentioned Michel suture set was tried frequently; but in most cases of shell-wound, it proved of little avail.

Dental Surgery.—Many days and months had now elapsed since the war broke out; and many patients began to come in suffering from tooth-ache. This was a complaint for which we had not made adequate provision and on June 7, 1904, Staff Surgeon B. Harada, who had had some experience of dental surgery,

was appointed to a Hospital-ship to attend to such cases. The constant movements of the fleet and the frequent recurrence of the complaint soon made it evident that one man would be insufficient for the work. From Jan. 26, 1905, four civilian dentists were attached to the Fleet: it being their duty to make a tour of all the vessels of the Fleet in turn, to attend to the dental cases.

SECTION VI. AIM OF SANITATION IN WAR TIME.

I. General Remarks.

Towards the end of the year 1903 the situation of affairs having grown more critical, the Medical Bureau of the Imperial Navy expressed a desire that the medical officers in all quarters should devote their whole attention to the preservation of the health of our fighting men, the result being the present excellence of the sanitary condition of the whole Navy.

The sanitation measures taken by our Navy during the war were essentially the same as at ordinary times, every medical officer having his duty defined for him by the General Instructions relating to the duties of medical officers; and we need only remark here, that still closer attention was paid to the ventilation of the ships, and the victualling, and clothing for men, etc. Lectures on hygiene and sanitation were also given from time to time, the object of which was to advance the hygienic ideas of individuals. In certain localities also, such as Naval Ports, Secondary Naval Stations, etc., no opportunity was omitted of co-operating with the local government officials for the strict enforcement of the sanitary measures to be taken at such locality.

Previous to the departure of the Fleet, Chief of the Bureau of Medical Affairs, Baron Y. Saneyoshi, assembled the medical officers of the fleet and squadron at the Sasebo Naval Hospital and delivered a lecture, the gist of which ran briefly as follows:—

“ My inspection of general sanitary conditions shows an almost entire absence of contagious diseases. It is true that the other day a case of typhoid fever occurred on one of our ships; but fortunately it never spread,—and that has been the only case. One of the most regrettable features of all warfare hereto-fore

has been the danger of consequent epidemics of infectious diseases : in the present crisis we must, simply, do our utmost and leave nothing undone in the way of prophylactic or prevention. It is the present duty of us, men of the medical profession, to be well aware of, and properly to appreciate the heavy responsibility imposed upon us by the State.

“ Now as to venereal diseases, in spite of all that has been done for their prevention, no satisfactory results have yet been attained ; and the reports from all quarters shew us that sufferers from these diseases form a large majority of our patients. I am sure that we require more strenuous efforts in dealing with these diseases.

“ Of other diseases I shall say nothing. I may say that the number of patients seeking medical advice throughout the fleet was in most ships less than 7 per cent. of the complement, that it rose to 10 per cent. only in a few ships and that the number of men unfit for duty was only 1 per cent. In short, the sanitary condition may be said to be generally good. This is fairly due to the meritorious services of the gentlemen here.

“ A word in conclusion you must know how important for future reference and study are the medical reports made during the war. I therefore beg to call your attention to the following points : although I do not expect such things as Medical Journals to be kept with much detail in the midst of confusion, at least the entries should be to the point ; the sanitary returns for the war time should be thoroughly full in detail ; and the nosological returns, though periodical, should be sent in specifically as often as possible, not omitting even fragmentary pieces of information.”

II. Precaution Against Contagious Diseases.

An occurrence of contagious diseases in the midst of war is a dreadful thing. The Naval Medical Bureau, therefore, contrived to obtain information at first hand concerning sanitary condition in all quarters both at home and abroad ; and through communications opened with the authorities concerned, sent an order to Staff Surgeon Y. Wada, resident at Seoul, to telegraph from time to time about the sanitary conditions in Korea.

Soon after the outbreak of hostilities, there occurred three cases of smallpox among the refugees coming from Vladivostock to Moji. Then a report came of the discovery of some cases from a ship coming from China. As it was feared that the disease might spread around Kyūshū, an instruction was issued addressed to medical officers in general and dated Feb. 16, 1904. It ran as follows:—

“Smallpox is now prevalent in Vladivostock. A report has been received at the Home Department from the Quarantine Station at Moji, stating that three cases had occurred on board the German ship, *Batavia*. It is, therefore, desired that men of the Army and Navy as well as all civilians attached thereto, who have allowed five full years to pass since being vaccinated, and, regardless of such limitation, all the boatmen, workmen, coolies, etc., should be vaccinated at this juncture, etc. etc.”

After the opening of hostilities, the entry and exit of ships and vessels growing more animated and brisk, and many of the vessels chartered by the Navy carrying no medical officer, it became highly necessary for purposes of prevention against contagious diseases to exercise proper control over these vessels; and an instruction, dated Feb. 13, was issued from the Medical Bureau, addressed to the chief medical officers of the Naval Stations, as under:—

“Although it is but proper that the sanitation of our ships entering the harbour should be attended to in pursuance with the Detailed Regulations of the Naval Port; yet with regard to the sanitary affairs of ships and vessels carrying no medical officer, it is highly desirable that some special measures be devised for their better supervision, so that nothing may be omitted for the prevention of infectious diseases.”

Quarantine is indeed enforced at Naval Ports, both ordinarily and in times of war, in accordance with the Detailed Regulations of the Naval Port, against cholera, dysentery, typhoid fever, smallpox, typhus fever, scarlet fever, diphtheria, pest, relapsing fever, measles, etc.

Any ship entering the port must, immediately on coming to anchor, report her sanitary condition thereof to the Commander-in-Chief of the Naval Station concerned; and on the occurrence of any case, as e. g. of cholera, smallpox or pest, the ship must signal at once to the Naval Station, so that it may receive a

visit of inspection from a medical officer and by order of the Commander-in-Chief be isolated and disinfected. When the Commander-in-Chief of a Naval Station sees any danger of infection from the prevalence of a contagious disease not only in the neighbourhood of the Naval Port in question but also in any sea-port, either home or foreign, with which there is intercourse, he gives notice of special medical inspection, and by appointing a special commission strictly enforces the quarantine. Ever since the beginning of the present war, strict attention had been devoted to the prevention of infectious diseases by making the chief medical officer of the port offices pay visits of inspection from time to time on the ships and vessels carrying no medical officer that lay in every Naval Port. In Sasebo a special quarantine commission was appointed on May 14; and quarantine was strictly enforced at the port.

The establishment of a quarantine station at Sasebo being deemed necessary, the Commander-in-Chief of the Naval Station presented his views before the Naval Minister on Feb. 5, 1904; and sanction having been obtained, it was established at Hyakkenbana on the Isle of Kuki, lying in the harbour.

Touching this special enforcement of quarantine at the port, the Home Department communicated with the Naval Department on Feb. 15, to the effect that in all Naval Ports proper control should be exercised by the Navy; but that until the Hyakkenbana Quarantine Station should be completed, the Megami Quarantine Station, Nagasaki, might be employed. Again on Feb. 22, 1904, the Minister of Home Affairs informed the Minister of the Navy that a proposal had been presented by Dr. S. Kitazato, Director of the Institute for the Study of Epidemic Diseases and the Serum Institute, stating that he would like to inoculate our men going to the front so as to prevent infection from contagious diseases. To this the Naval Minister replied that it should be done whenever deemed necessary. The views held by the Medical Bureau will be seen from the notification issued by the Chief of the Bureau, Baron Y. Saneyoshi on March 7, to the medical officers in general as given below:—

“ Preventive inoculation against contagious diseases is, I believe, at this time of war a question engaging the attention of all the medical officers in charge. With regard to inoculation for the prevention of the principal infectious diseases, such

as typhoid fever, dysentery, cholera, and pest, I publish herewith a general direction, as under:—

“Cases of abdominal typhus occur at times in some of our ships, but have not yet become prevalent. We should not however wait until such time as the disease becomes prevalent. Inoculation should, at once and without hesitation be adopted as a preventive measure in such cases, wherever advisable. Large crowds of coolies have been gathered at the temporary base of operations, and local circumstances foreshadow the occurrence of typhoid fever, so much so that some persons say that inoculation is necessary at this time. But it is my desire, that we should first pay strict attention to the drinking water and other matters bearing on sanitation, so as to prevent infection as much as possible. If then, unfortunately, the disease should become prevalent, we should try inoculation upon one half of the men to begin with, and wait to see the result it may bring forth.

“The vaccine for prophylactic inoculation is to be prepared at the Medical College of the Navy. Dysentery, which is prevalent in some parts of Korea, being a disease whose real nature is not yet fully ascertained from a scientific point of view, further study is required before preventive inoculation can be turned to practical account.

“Cholera vaccine has already been tried in our country; but as to its efficacy there is still room for doubt. It has not been scientifically established and I therefore hesitate to try it at this crisis. There is, however, no risk accruing from it, and I raise no objection to its being practised upon those only who desire for it at a time of great prevalence of cholera.”

“The preventive inoculation against pest or plague is highly efficacious: it lessens the number of victims and lowers their death-rate by bettering their condition. It is, therefore, permissible to practise it upon those who are obliged to stay in a locality where such disease is prevalent. It must be noted, however, that the treatment takes six or seven days before it displays immunitive functions in full strength. It would be better, in cases where there is a suspicion of having been infected by contact with a sufferer, not to resort to this treatment, but rather to inject some powerful anti-toxic serum at once.

“ For the vaccine for preventive inoculation as also for the serum, apply for the time being to this Bureau.”

After some time, cases of typhoid fever occurred in Chin-hai Defence Corps. It was just at the time when operations there were in full swing, and multitudes of coolies were continually coming and going, which made it very difficult to enforce sanitation rules among them. Inoculation was performed on every one of them for the prevention of the disease, and the results proved quite satisfactory.

There being no distinct item of expense for preventive measures against infectious diseases, such expenses used to be defrayed out of Patients' Expenses and other items by diversion whenever necessary. But in time of war much being needed for special sanitary purposes, it was thought desirable not to resort to such temporizing measures as had hitherto been employed. With a view to having such expenses defrayed out of the Expenses for Naval Stores, negotiations were opened with the Department of Material of the Navy, and a demand was made for a sum of 12,000 *yen* to be inserted in the Budget for the 38th fiscal year (1905). All this was consented to. In June, 1904, the hot season being just about to set in, the weather became favourable for the activity of pathogenic germs. So the Naval Medical Bureau issued an instruction to the medical officers embarked on special service ships to the following effect :—

“ Though we are fully confident that our medical officers are always alert in the prevention of contagious diseases, special attention is nevertheless invited to the subject at this season as we are now drawing towards the hot and damp season when various germs of bad diseases come into activity. Ships for transportation and correspondence plying constantly between home and the ships at the front are liable to become mediums for spreading infectious diseases. The chief medical officers of such ships are, therefore, requested to carry into practice the following rules. Some of the rules may already be in force; henceforth, however, they must be put into stricter enforcement.

“ 1. To inspect the food and drink for seamen, coolies, etc. (all outside naval circles).”

“ 2. To exercise control over insanitary practices among seamen, coolies, etc., not only on board ships or vessels, but on the shore, also.”

“ 3. To hold sanitary examinations whenever necessary in accordance with Art. XVII., Chap. IV., ordinance relating to the duties of officers on war-ships. (For reference.)

Ordinance Relating to Duties of Officers on Board Ships of War.

Chap. IV.

Art. XVII.—Chief medical officers shall inspect whether or not there is any serious case of disease concealed among petty-officers and men in the presence of a divisional officer on the first Thursday in every month and at any other time that is deemed necessary.

“ 4. On arrival at a Naval Port or at a place where a fleet lie, a report as formulated below must each time be submitted to the Chief Medical Officer of the Naval Station or to the senior medical officer attached to the fleet (or to the chief medical officer of the flag-ship), giving information as full as possible about the sanitary conditions on board the ship and at the place of their departure.

No.....bed ridden patients

No. patients from wounds

No. patients from contagious diseases.

Place and Date of Departure.

Departed from.....infected or not, on.....day.....month.....

If the place of departure be infected, state the particulars of disease.

Date and

Signature

Address

Chief medical officer

.....*Maru*.

“ 5. Whenever on board any special service ship any case of infectious disease occurs, a report thereof shall immediately be sent to the senior medical officer attached to the fleet or to the chief medical officer of the flag-ship.”

It was expected that the Maidzuru Naval Station which stands facing the Japan Sea would become an important position as the war went on. Notwithstanding that there existed no institution there for quarantine and disinfection, the necessity of establishing a quarantine station at that port had long been recognized and planned.

Sanction to defray the expense out of the Extraordinary War Expenses

having been obtained on June 21, a quarantine station was established on the Isle of Toshima within the Naval Port.

Disinfecting establishments were also placed in the Takeshiki and Bako Secondary Naval Stations, and disinfecting plants were installed large enough to meet any demand on a small scale.

To those on service in localities south of the Isles of Amami Ōshima, mosquito hoods, mosquito gloves, etc., were lent, as preventives against malaria; and they were cautioned to sleep under mosquito curtains at night without fail.

III. Food, Drinking Water and Clothing.

1. Rations.

Food supplies for our Imperial Navy are furnished in kind from the Victualing and Clothing Depôt of each Naval Station, the articles and quantities being determined by prescribed rules relating to the Food Supply of the Navy. With a view to the prevention of *kalke*, the system of money allowances was abolished in 1884, and one of rations of food adopted in order that the food provided might contain just as much nourishment as was reasonable from physiological point of view. Further improvements have been introduced into the rules from time to time; but the fundamental principle has never yet been lost sight of. The rules regarding food in force at the beginning of the war being those issued in 1900, prescribe the quantity and kind of food per head, as under:—

TABLE I. DAILY ALLOWANCE OF FOOD {Instruction No. 86 of the Imperial Navy, dated
May, 1900.

	Bread		Fowl, Meat, Fish				Cereals				Vegetable		Tea etc.		Sugar	Soy, Vinegar Oil, etc.			Fat				
	Biscuit	Loaf	Preserved meat	Preserved fish	Meat with bone	Fish or fowl with bone	Cleaned rice	Barley	Pulse	Flour	Dried	Raw	Tea	Parched barley		Soy	Vinegar	Sesame oil					
			Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.	Mon.			
(A) Fare on Ships at Sea.	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	20	...	0.5	1	6	...	...	...	...
	...	...	...	...	...	...	...	...	25	15	...	...	...	...	28	2.5	0.4	0.1	15
	350	...	280	282	...	...	700	245	25	15	140	...	3.5	7	70	2.5	0.4	0.1	15		
Grand total		350		560		985		140		10.5		3		70		15			10				
(B) Messing for Men on Shore Stations and Vessels at Anchor.	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	50	...	40	40	...	...	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
	...	65	...	...	60	40	100	35	...	...	...	120	0.5	1	6	...	...	...	...
Total		50	390	40	40	360	240	700	245	25	15	...	3.5	7	70	2.5	0.4	0.1	15				
Grand total		440		680		985		840		10.5		3		70		15			10				
(C) Food for Prisoners.	...	120	...	...	30	...	30	...	30	...	...	100	...	...	...	...	...	...	...
	120	...	...	...	...	40	30	...	20	...	...	100	...	...	...	...	...	...	...
	...	120	...	...	30	...	30	...	30	...	...	100	...	...	...	...	...	...	...
	...	120	...	...	...	40	30	...	30	...	...	100	...	...	...	...	...	...	...
	...	120	...	...	30	...	30	...	30	...	...	100	...	...	...	...	...	...	...
	...	120	...	...	...	40	30	...	20	...	...	100	...	...	...	...	...	...	...
	120	...	...	...	30	...	30	...	30	...	...	100	...	...	...	...	...	...	...
	...	120	...	...	...	...	...	...	...	...	...	100	...	...	...	...	...	...	...
	...	120	...	...	...	...	...	...	...	...	...	100	...	...	...	...	...	...	...
	...	120	...	...	...	...	...	...	...	...	...	100	...	...	...	...	...	...	...
Total		240	600	...	120	210	...	190	...	...	700	...	...	...	...	0.5	0.2	...	40
Grand total		840		240		400		700		0.7		40		20		40			20				
For Supper	30 or 40		0.5		4																		

REMARKS.

1. Preserved meat is of three kinds,—corned beef, boiled beef, and roast beef in cans.
2. Preserved fish is of three kinds,—canned salmon, canned trout, and canned sardines.
3. For ships navigating in foreign waters, preserved meat and fish of other kinds than those provided in the foregoing two articles may be bought in sufficient quantities for consumption during the voyage.
4. Fresh meat is of two kinds—beef and pork.
5. Sugar for use in cooking is brown sugar, and white sugar for other use.
6. Canned corned beef shall be allowed not more than twice per week.
7. Preserved fish or raw fish with bone can be changed for salt fish not more than twice per week.
8. Even while on a voyage, ships shall take in as much fresh food as they can store, to take the place of preserved foods.
9. Patients in hospital are not allowed preserved provisions on Monday, but may be offered some fresh provision in its stead.
10. When milk is substituted for nourishment as provided in the above list, one *sho* (about 2 litres) of milk should be taken as 500 *monme*.
11. For supper 30 *monme* of rice may be allowed in place of biscuit or loaf bread, but only in cases of necessity.
12. The daily fare on Monday as per Table (B) may be interchanged for that of other days, for convenience of cooking,—one or two articles in the list being replaced by fresh articles of the same sort.
13. The maximum amounts of tea, parched barley and other articles being quoted below, any less amount may be given at discretion.
14. For prisoners on regular service an increase in quantity is allowable within the limit of $\frac{1}{4}$ of loaf bread, $\frac{1}{3}$ of fresh meat or fish and 20 *monme* of cracked barley.
15. When enlisted men or civilians on service are kept in confinement or sent under convoy, or in cases of extraordinary emergency, when proper food as provided in Art. VI of this regulation cannot be procured, 50 *monme* of biscuit is allowable for one meal per head.
16. Only once per week 60 *monme* of raw meat with bone may be substituted for 50 *monme* of raw fowl with bone. For the crews of torpedo destroyers raw meat with bone may be substituted for raw fowl, or meat without bone.
17. For an invalid in prison, when the state of his health requires it, 30 *monme* of rice gruel is allowable, without either biscuit or loaf bread.

TABLE II. AMOUNT OF PROVISION—ALLOWANCES FOR ENLISTED MEN, CIVILIANS
AND OTHERS, PURSUANT TO ART. CXXII. OF ALLOWANCE REGULATIONS.

(In force on and after April 1, 1904.)

	Bread		Meat and Fish				Cereals						Vegetable		Tea, Parched Barley etc.		Sugar	Soy, Vinegar, Oil, etc.			Salt	Fat	Spec.
	Biscuit	Loaf	Preserved meat	Preserved fish	Fresh meat	Fresh fish	With bone	Rice	Barley	Pulse	Flour	Dried	Fresh	Tea	Parched barley			Soy	Vinegar	Sesame oil			
(A)	50	...	40	40	Mon.	...	Mon.	...	Mon.	100	35	Mon.	...	Mon.	20	...	Mon.	6	...	...	...	...	...
	...	...	...	...	...	...	...	...	...	20	15	...	...	...	...	...	...	28	25	4	1	12	8
	
(B)	...	65	...	...	60	40	Mon.	100	35	...	...	Mon.	120	0.5	1	6	...	...	...	...	...	...	8
	...	...	...	...	...	...	...	...	...	20	15	...	...	...	...	28	25	4	1	12	8	...	
	
(C)	Sunday	120	...	...	30	...	...	30	...	20	...	100	...	...	...	...	...	...	...	...	...	...	...
	Tuesday	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thursday	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Saturday	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Monday	120	...	...	...	40	...	30	...	30	...	160	...	...	...	...	...	...	...	...	...	...	...
	Friday.	...	...	...	...	...	...	...	...	...	...	100	...	...	...	...	...	...	...	...	...	...	...
	Wednesday.	120	...	...	...	40	...	30	...	30	...	100	...	...	...	...	...	...	...	...	...	...	...
	Weekly allowance for cooking...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	2	...	40	20	...	...	...
	For Supper.....	30 or 40	...	...	...	...	...	...	...	...	...	...	...	0.5	...	4	...	...	...	...	...	...	...
	Spirit.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2 one time

* A Japanese measure of capacity, equal to 18 c. e.

REMARKS.

1. Preserved meat is of three kinds,—canned beef, canned boiled beef, and canned roast beef.
2. Preserved fish is of three kinds,—canned salmon, canned trout, and canned sardine.
3. For use during navigation in foreign waters, preserved meat and fish may be bought of kinds other than those given in the foregoing clauses, but only in quantities as is sufficient for consumption during that voyage.
4. Fresh meat is of two kinds,—beef and pork.
5. Sugar for cooking is *enko* (brown sugar) and *sambon* (white sugar) for other purposes.
6. Spirits are of four kinds,—*awamori*, rum, gin, and *shichu*.
7. (A) is for the ships at sea, (B) is for ships at anchor and shore stations, and (C) is for prisoners and those under No. 9, Art LXXX, of the Allowance Regulations.
8. N. B. In case proper food as per Art. CXXVIII. cannot be procured, 50 *monme* of biscuit may be given for one meal. Even during a voyage, the allowances provided in (B) should be given as far as possible, viz. as much fresh meat etc. as possible.
9. When diet is provided by (B), 60 *monme* of biscuit, and no fresh bread is given every first Monday during the eight months from January to August; and every first and third Monday during the four months from September to December. Every first and third Monday, forty *monme* of preserved meat or fish are allowed, no fresh meat or fish with bone being given.
(N. B. Patients in hospital are excepted.)
10. The daily allowance as regulated above is interchangeable with the allowance for any other day within the same week.
11. Preserved fish or fresh fish with bone are interchangeable for salted dried fish not more than twice per week.
12. Only once per week 60 *monme* of meat with bone may be substituted for 50 *monme* of chicken with bone.
13. Canned corned beef, *tofu* (bean curd) and *koungachu* (hydrogne rivier) may be given oftener than twice per week.
14. When cow's milk is substituted for any of the prescribed articles, one *sho* of it shall be counted as 500 *monme*.
15. Biscuit or loaf bread may be changed for 30 *monme* of rice for supper, but only in cases of necessity.
16. On destroyers and torpedo-boats meat with bone may be changed for boneless meat.
17. Biscuit and sugar for several days may be supplied at one time.
18. The maximum amounts being given in the list for tea, parched barley and other articles for cooking, any smaller amount may be given at discretion.
19. For prisoners with regular employment an increase may be given within the limit of $\frac{1}{3}$ of loaf-bread, (or 10 *monme* of rice and 20 *monme* of cracked barley) $\frac{1}{3}$ of fresh meat or fish with bone and 20 *monme* or less of cracked barley.
20. Prisoners sentenced to be "underfed" are subject to Prison Regulations.
21. When the sick in prison are to be fed with rice gruel necessitated by the condition of their illness, 30 *monme* of rice is allowed per meal, no biscuit nor any loaf bread being given.

With the commencement of hostilities, certain amendments became necessary in the dietary system ; and the Minister of the Navy, Baron Yamamoto, issued an instruction, dated Feb. 10, 1904, as follows :—

“ For the time being, biscuits and preserved meat and fish for Monday in (B), Table I, Dietary Regulations, shall be changed to fresh provisions, and in (C), the same Table, 120 *momme* of biscuit to the same quantity of loaf bread, and 20 *momme* of pulse shall be increased to 30.”

As the work at the front became more strenuous, an increase of food allowance was permitted on board all the ships, within the limit of 20 % on each article of the diet as provided in the 8th clause of Art. 1, Dietary Regulations, and public notice to that effect was given on March 2 to all the ships of the squadron, with the limitation that rice was not to exceed 100 *momme* per day for one person.

Two ships were specially concerned in the supply and distribution of provisions for the ships and vessels at the front, the s. s. *Fukuoka Maru* and *Matsuyama Maru*.

These ships were installed with ice-machine, ice making tank and cold storage room, cattle and poultry yards, an abattoir fully equipped out and newly reconstructed, store-rooms for fresh vegetables, bread, preserved provisions and supplements for preserved provisions and other articles to meet demands.

Afterwards another ship was added, the s. s. *Kotohira Maru*. These three ships took turns in following the Fleet.

With regard to the examination of provisions to be shipped, the Chief of the Medical Bureau, gave an instruction to the above three ships in April, 1904, to the following effect. “ The provisions to be shipped in victualling ships should previously have undergone inspection ; but care should be taken to see that there is no likelihood of change or decomposition. As for cattle even though they should have undergone a medical examination by a veterinary surgeon, before being slaughtered, yet when slaughtered their internal organs still require a rigid inspection as to the existence of diseases, if any.

“ As to how and how far this inspection should be carried out, you should conform, for the present, to what is given in Part III, “ Naval Hygiene ” by Jules

Rochard et Denis Borlet, due regard being had to economical points in making the selection, and making all possible allowances, provided they cause no serious injury to men. As for the instruments of pathological examination, you should get them from the Sasebo Naval Hospital.”

Hereupon the chief medical officers of each ship took on themselves the control over the abattoir, assisted by the ship's sickberth stewards; and having obtained on demand the following instruments and articles for consumption, prosecuted the examination of the viscera of slaughtered cattle.

PERMANENT ARTICLES.

Microscope with oil immersion objective	No.	1
Microscopic needles.....	Do.	2
Accessories case for the microscope	Do.	1
Bottles for preparation.....	Do.	5
Dissecting case, small.....	Do.	1
Valentin's section knife	Do.	1
Spatulas	Do.	2
Cornet forceps.....	Do.	2
Large glass bottles	Do.	3

CONSUMABLE ARTICLES.

Watch glasses	No.	2
Test tubes.....	Do.	100
Beakers.....	Do.	4
Filter paper	Sheet	20
Glass funnels.....	No.	2
Glass rods.....	Do.	2
Petri's plates.....	Do.	2
Canada balsam.....	Gramme	28.0
Formalin	Do.	900
Alcohol, absolute.....	Do.	900
Glycerine	Do.	450

The process of examining the internal organs of slaughtered cattle, which was almost the same in all the ships, was briefly as follows :—

“ 1. Stripping the skin off the head and cutting it between the first cervical vertebra and the condyles of the occipital bone, see if the lower jaw, especially at the angle, is not swollen, thereby ascertaining that there exists no actinomycesis.

“ 2. Skin the trunk and look closely into the lymphatic glands if any of them are swollen, cut open and examine the interior ; open the abdominal cavity and ascertain whether the peritoneal surfaces are studded with tubercles (or nodules) or not. Open the chest by sawing the sternum lengthwise, inspect the thoracic wall, the pleura and the diaphragm.

“ 3. Saw off the pubic symphysis and passing a rod between the tendons and muscles of the posterior femoral region on both sides, hang the body up upside down by means of a pulley, and taking out the viscera from the abdominal cavity, inspect the mesenteric glands ; and finally, cut open the intestine, and examine its mucous membranes.

“ 4. Taking out the spleen, liver, and kidneys, cut them one by one and look into the surface made by the cut ; and with the kidneys strip off the capsules one after another, taking special care to split up the lymphatic glands in the part whence the renal arteries branch off from the abdominal aorta, in order to ascertain that there exists no caseation. This is important because in cases of renal tuberculosis these glands are invariably involved in the caseous degeneration.

“ 5. Drawing out the lung together with the heart, examine the pericardium and cut open to see into the ventricles and auricles on the right and left ; and with the lung, carefully inspecting its outer surface, palpate it with both hands. This palpation is one of the most important points of examination, for by it is known not only the existence (if any) of the infiltration, induration or tubercle inside the lung, but also certain morbid conditions in the bronchioles may be known by an experienced touch. It is, therefore, indispensable as a mode of ascertaining the focus of diseases in the lung. After that cut the lung in two with your knife, and then if, by grasping the surface of the cut, any induration or infiltration, is palpably noticeable, cut open that part with the greatest care ; and if there should be any suspicion of the existence of caseous degeneration, make a

cover-glass preparation to prove the existence of tubercle bacilli. When their existence is ascertained either in circumscribed portions or in a diffused state, such flesh must be rejected as useless.

“To be brief, tubercle bacilli must be made a point of importance in the whole examination, as it has often been believed that, provided there has been sufficient boiling, there is not much danger in serving up at table any meat that is affected with morbid conditions such as parasites, distoma, hydatid tape worms, etc.; so that any flesh, unless affected with a high degree of malnutrition, has been generally taken as fit to be served at table.”

The live cattle forwarded to the front from the beginning of the war till its conclusion numbered 9,324 head, while living pigs, requiring trouble in slaughtering and affording a lesser quantity of meat, were not sent forward more than once or twice.

The Naval Heavy Gun Brigade placed under the Commander of the 3rd Army took part in the siege of Port Arthur. For their rations they had to depend upon the victualling on the field furnished by the Army; but on behalf of the Navy, seeing from past experience that the food thus supplied was insufficient for the preservation of their health, Staff Surgeon J. Sudzuki attached to the brigade, reported to the authorities that the difference between the victuals allowed by the Army and those prescribed by the Naval Regulations should be supplied by the Navy. After some negotiations this was granted and carried into effect on and after the 16th of July, 1904. The consequence was that not one man on the whole brigade fell sick with *kakke*, and that all remained in perfect health.

With regard to the rations for petty officers and men on board the ships on special service, it was arranged with the master of such ships to board them on an allowance of 7 *sen* for one meal per head. A communication to this effect was sent on Jan. 1, 1904, by Paymaster General Baron K. Murakami, Chief of the Bureau of General Accounts and Supplies of the Naval Department to the accountant officers in charge of the Direction of Accounts and Supplies at the Naval Stations. Thus on all ships allowances in money were made on the seven *sen* per meal system. As to the messing for the seamen, workmen, coolies, etc., (not

enlisted) on board ships on special service, an order was given that to those of them that lived in the same cabins as warrant-officers or above, by nature of their service, may be granted table-money apportioned to the cabin according to Section I under Article 1 of the Dietary Regulations of the Navy; and to workmen, and coolies embarked on special service ships and torpedo depôt ships according to Section II under the same Article. To equalize the management in different quarters with regard to the above, the Chief of the Bureau of General Accounts and Supplies sent a communication to the accountant officers in charge of the Direction of Accounts and Supplies at the Naval Stations on Jan. 20, and made it a rule to have the coolies on board transport ships boarded at 7 *sen* per meal, just for the time being, whenever their messings were not given by the Government, and to have these sums paid by every one of them; while the rations for the hired men and coolies ordered to embark on special service ships (converted warships excepted) should be on the basis of the allowance on money at 7 *sen* per meal. To those ordered to embark on converted warships allowances should be made in kind, corresponding to those for petty officers and men; provided that, in the case of the coolies embarked on transport ships or other vessels on special service, if their ship-masters should find it impossible to furnish board them through the necessities of the war, the government should provide allowance in kind. Owing, however, to the general rise in prices, the above rate in money was found insufficient for the purchase of proper food, and a special Allowance Regulation for war time came into force on April 1, by which petty officers, men, and workmen on special service vessels, were allowed 10 *sen* per meal, and coolies and boatmen on board vessels were boarded for 8 *sen* per meal, unless the government undertook to provide necessary food for them itself.

In process of time the price of articles rose higher and higher, and the increased rates of allowance were not sufficient to pay for food as required by the Naval Regulations. Such being really the case, the chief medical officers on all ships made great efforts to procure materials for food as good as might be; but in vain. In the meanwhile, the warm season being about to set in, some two or three cases of *kakke* occurred among the hired men on board workshop vessels, and there seemed to be a tendency to increase. Hereupon the Com-

mander-in-Chief of the United Squadron, Admiral Togo expressed his desire by telegram to the Naval Minister stating that as on workshop vessels, hospital ships, and water distilling vessels carrying large numbers seamen and hired men, the dietary system as at present in force would not provide food sufficient from a physiological point of view to guarantee the preservation of health, it was desirable that allowances in kind should be made of victuals as prescribed by the Naval Regulations. After this the numbers of cases of *kakke* on workshop vessels gradually increased, and the above telegraphic request was repeated. At last the request was granted after due deliberation; and on and after July 3, allowances in kind came to be granted on workshop vessels.

The same request was also made repeatedly, in Feb. and June of the same year, by Surgeon Inspector T. Honda, the Surgeon in Command of the Hospital Ship *Kobe Maru*, to the Chief of the Bureau of Medical Affairs. The result of deliberations in this case also, was the issue of an order, dated June 28, stating that henceforward the allowances for food for petty officers and men as well as employes embarked on hospital ships should be granted in kind.

2. Drinking Water.

All the ships and vessels of the Navy, excepting some torpedo-destroyers and the like, carry distillers, by means of which distilled water is at all times made for drinking purposes, when good natural water is improcurable.

At this time of war, too, it was made a rule for each ship to manufacture distilled water for drinking purposes, so far as this did not interfere with the duties of the ship. For fear, however, lest the ship's duties should not allow time for distillation, and with a view to supply drinking water as well as water for boilers to the torpedo-boats, torpedo-destroyers, etc., two steam ships were fitted out as distilling ships and dispatched to the base of operations for the fleet; viz., s. s. *Yamaguchi Maru*, and s. s. *Hiroshima Maru*.

Hereupon the Chief of the Bureau of Medical Affairs of the Naval Department, wishing to have the supply water bacteriologically examined, ordered the Director of the Sasebo Naval Hospital to make a provision of necessary articles for the examination, and notified the chief medical officers of such ships as follows:—

“ In the matter of the supply of water to the ships of the fleet and fleet auxiliaries, not only fresh water, but distilled water also, must pass a definite scientific examination, and a further bacteriological inspection is also required. For this purpose requisite equipments must be procured :

“ But, before all, you are requested to observe the following :—

‘ 1. Drinking water before being shipped must pass an examination.

‘ 2. The original water may be good, but if the water-boat is bad or if the water is kept too long in store, it may become unfit to drink by reason of the sea water leaking in. In examining water, regard must, therefore, be had to the condition of the water-boat and to the time of storage.

‘ 3. The original water and the water-boat may both be good ; but if it is shipped in a ballast tank which has contained sea-water, unless the tank be washed quite clean, the sea-water remaining may make the shipped water unfit to drink. The ballast tank must, therefore, be kept as free from sea-water as possible.

‘ 4. The water put into the ballast tank must be tested from time to time to ascertain if it remains up to the standard of the original examination ; i.e. to see if there is any admixture of sea-water.

‘ 5. When fresh water is conducted through a hose that has been used for sea water, the little that may remain in the hose often makes the fresh water unfit to drink. It is advisable to make use of distinct hoses for fresh and sea-water.

‘ 6. In distilling water, if too much pressure is put on the evaporator, there will be salt in the distilled water which may make the water unfit to drink. Care must therefore be taken as to the pressure, when distilling water.

‘ 7. Water deemed unfit to drink by examination as above may be applied to other uses, e.g. to feed the boiler ; but if there is any fear of its having been soiled or infected, it must be thrown away.

‘ 8. In most cases, the virus of contagious diseases makes drinking water the medium for its propagation, so that strict attention must always be paid, for the preservation of health on the ship, in such a way that, in case any contagious disease should break out, disinfection should at once be put in force, and if any danger should be apprehended from the water supplied, a conference must be held

with the officer in charge, in order to stop the supply until proper directions are received from the Commander-in-Chief in control.'

"Until proper equipments have been completed for bacteriological examination, apply to the hospital ship whenever any necessity arises for examination.

"As for the instruments for chemical as well as bacteriological examinations, receive delivery of them from the Sasebo Naval Hospital."

In pursuance to the above instructions provision was made as required, on the ships *Yanaguchi Maru* and *Hiroshima Maru* of microscopes with requisite accessories for bacteriological examination as well as for water testing.

The matters that engaged the attention of the chief medical officers on all the ships were briefly as below :—

1. Before sending distilled water into a water tank, it must be tested by a standard silver nitrate solution.

2. A little of the distilled water in the water tanks had to be taken every night, put into a distinct bottle for that night, and allowed to stand for the whole of twenty-four hours. The bottles were then collected in the laboratory and tested, physically and chemically.

3. Whenever, in pumping out water, it was found to be turbid, the water was thrown away until it became perfectly clean.

4. In transshipping water to another vessel, tests were made each time by nitrate of silver, for the existence and quantity of chlorine contained in the water.

5. In order to test if any sea-water had leaked into the water-vessel, the water was allowed to stand for a certain period of time after being shipped, tests being made both before and after that period.

6. With watering ships carrying supplies of fresh water, tests were made every time the ship took in water from water-boats; and whenever the water was found unfit for drinking, shipments were stopped. In case of furnishing water-supplies, the water in each tank was tested, special care being taken to have the water pipe entirely distinct from that for conducting sea-water, and to have it kept perfectly dry and clean after having been used.

The quantitative estimation for chlorine and organic matters runs briefly as below :—

Chlorine.—To 100 c.c. of water for test add 4 drops of chromate of potassium solution (1 : 20). Begin titrating into this, while stirring hard, the decinormal silver nitrate solution from a burette, and stop titration as soon as a crimson red colour is permanently obtained. Now calculate how much of the silver solution has been expended : that will be the quantity of chlorine contained, one c.c. being 3.55 milligrams of chlorine, (5.85 milligrams of table salt).

Organic matters.—Put 100 c.c. of test water into a flask. Add to this 5 c.c. of dilute sulphuric acid (1 part sulphuric acid and 3 parts of distilled water) and 10 or 20 c.c. of potassium permanganate solution (0.395 of potassium permanganate in a litre of distilled water). After boiling the mixture for 5 minutes, pour into it a definite quantity of oxalic acid solution (0.7875 gr. of pure crystallized oxalic acid in a litre of distilled water.) to make it colourless ; and then add potassium permanganate solution again, just sufficient to obtain a permanent faint pink colour. Now calculate the amount of potassium permanganate consumed ; and subtract from it the equivalent of the oxalic acid that has been added. Thus the amount of oxygen consumed by organic matter is found out. This is because 1 c.c. of potassium permanganate solution gives out 0.1 milligrams of oxygen to oxydize the organic matter contained, and 1 c.c. of oxalic acid solution is oxydized by 1 c.c. of potassium permanganate solution.

Afterwards the demand for fresh water grew more and more pressing and the two ships being found insufficient, two more were fitted out, viz. the *Taisei Maru*, and the *Colombo Maru*. These were converted into fresh water transport vessels and were made to run between Sasebo and the place where the fleet lay, in order to help in the supply of fresh water.

The water obtained from the water-works at Sasebo was apt to prove insufficient to meet the increased demand, so that after various researches made, the water drawn from the upper part of the river Ōnogawa in the same locality was taken to supplement the deficiency whenever it was found necessary to do so.

3.—Clothing.

The following is a list of the clothing for petty officers and seamen supplied by the Imperial Navy in peace time :—

CLOTHING FOR PETTY OFFICERS AND MEN.

	Article	Material and Make.
Chief Petty Officers and P.O. 1st Class.	Dress jacket.	Blue serge, lined with twilled black cotton, pockets of thick raw cotton, with stand collar, single-breasted.
	Trousers.	Blue serge, lined about loins, pockets and crotch with thick raw cotton, buttons of black varnished zinc.
	White jacket.	Bleached <i>Ka'surag ori</i> (a kind of cotton), pockets of same material, with holes for buttons, with stand collar, single breasted.
	White trousers.	Bleached <i>Katsuragiori</i> , lined about loins, pockets with thick raw cotton, and buttons made of white horn.
2nd Class Petty officers and Men.	Jumper (for dress).	Blue serge with pockets of same material, watch mark of red stripe, collar with blue woolen braid.
	Trousers (for dress).	Blue serge, lined about loins and crotch with thick raw cotton, buttons of black horn.
	Serge jumper.	Same as "for dress."
	Serge trousers.	Same as "for dress."
	White uniform jumper.	<i>Ka'suragiori</i> , watch mark of blue cotton stripe, pockets of same material, collar with white worsted braid.
	White uniform trousers.	Linen, lined around the hip with thick cotton, buttons of white horn.
	Blue cloth cap.	Blue cloth, lined with black twilled cotton.
	Sennet hat.	Bleached leaves of hemp palm, or straw, topped with blue cloth 0.08 <i>shaku</i> in diameter, shaped round, height of crown 0.25 <i>shaku</i> , width of brim 0.29 <i>shaku</i> , brim edged with black cotton 0.015 <i>shaku</i> in width.
	Flannel.	White flannel, without collar, margined with dark blue cotton. The front 2.05 <i>shaku</i> long, the back 2.3, and 1.15 <i>shaku</i> in width.
	Kerchief.	Black satin, 2.1 <i>shaku</i> square.
	Check shirts.	Thick raw cotton, 1 <i>shaku</i> in length.
	Check collar.	Thick raw cotton, 1 <i>shaku</i> in length.
	Cap ribbons (for dress).	1.05 <i>shaku</i> wide, 3.3 <i>shaku</i> long.
	Cap ribbon (for working dress).	The same as above.
	Comforter.	Dark blue worsted knitting, left unwoven: at both ends, 90 <i>monme</i> in weight, 6 <i>shaku</i> in length, 0.8 <i>shaku</i> in width, unwoven parts 0.64 <i>shaku</i> each.
	Knife.	Handle of horn, with a ring for lanyard.
	Knife lanyards.	Three-fold braid of bleached cotton yarn, 2.9 <i>shaku</i> in length, 3 <i>monme</i> in weight.

Bandmasters and Bandsmen.	Dress jacket.	Scarlet cloth, lined with black twilled cotton, pockets of thick raw cotton, standing collar, single-breasted.
	Dress trousers.	Blue cloth, lined about the hip and under the crotch with thick raw cotton, buttons of black lacquered zinc.
	Blue jacket.	Blue cloth, otherwise same as dress jacket.
	Blue trousers.	Blue cloth, otherwise same as dress trousers.
	Jacket.	Blue serge, otherwise same as dress jacket.
	Trousers.	Blue serge, otherwise same as dress trousers.
	White jacket.	Bleached <i>Katsuragiori</i> , pockets of same material, standing collar, single-breasted, with button-holes.
	White trousers.	Bleached <i>Katsuragiori</i> , lining around the hip, and pockets of thick raw cotton, buttons of white horn.
C.P.O., P.O. 1st class, Band- masters and Bandsmen.	Overcoat.	Blue cloth, lined with black twilled cotton, pockets of thick raw cotton.
	Gloves.	Bleached fine cotton yarn knitting, lined and closed at the end with India rubber cord, 12 <i>monme</i> in weight.
	Cockade.	White hair, 0.7-0.8 <i>shaku</i> , with pins of 0.5 <i>shaku</i> , making on the top gilded cherry blossom, with a top of 0.16 <i>shaku</i> .
	Waistcoat.	Blue serge, outside of the back of black twilled cotton, lined, pocketed with thick raw cotton.
	Linen collar.	Calico, 0.13 <i>shaku</i> in width.
	Blue-cloth cap (for dress).	Blue cloth, lined with black twilled cotton, crown 0.12 <i>shaku</i> , 2 <i>sun</i> in width, visor 0.7 <i>shaku</i> long, 0.12 <i>shaku</i> in width, chin-stay 0.4 <i>shaku</i> in width.
	Flannel.	White flannel with collar of the same material, 2.5 <i>shaku</i> long in front, 2.3 in back.
	Cap badge for dress.	Brass, figure in relief, gilded, 0.12 <i>shaku</i> in diameter.
	Blue socks.	Blue cotton, lined with light yellow cotton, soles in doubled hemp cloth.
	Hood.	Thick raw cotton.
	Apron.	Thick raw cotton, 2.5 <i>shaku</i> long and 1.9 <i>shaku</i> broad, straps attached.
	Working jumper.	Duck, with watch mark and hem of blue cotton.
	Duck trousers (for working).	Duck, lined about the hip with same material.
	Over coat.	Blue cloth, lined with black twilled cotton.
	Water-proof coat.	Cotton, varnished black, with hood.
	Leggings.	Hemp fabric, 7 taped, with thick raw cotton straps 3.4 <i>shaku</i> long and 0.06 <i>shaku</i> in width, and hook.

	Article	Material and Make.
Petty officers and men.	Shoes.	Shoes with leather straps.
	Stockings.	Raw cotton yarn knittings, 21 <i>momme</i> in weight.
	Water-proof hood.	Cotton, varnished black, crown lined with thick blue serge.
	Drawers.	Thin twilled raw cotton, 2.75 <i>shaku</i> in length, with straps 3 <i>shaku</i> long, 0.07 <i>shaku</i> in width at the top; and other straps, 2 <i>shaku</i> long and 0.04 <i>shaku</i> wide at the lower end.
	Cap cover.	Bleached thick cotton, with small holes for string at the back part.
	Bed cover.	Thin twilled raw cotton, 3.75 <i>shaku</i> long, 1.75 <i>shaku</i> wide.
	Bag.	Canvas 2.4 <i>shaku</i> by 1.4 <i>shaku</i> , with holes, and hemp cord.
	Badge for overcoat.	Scarlet cloth, 0.2 <i>shaku</i> in diameter on a ground piece with 0.23 <i>shaku</i> diameter.
	Badges of rating.	Of scarlet cloth on blue serge dress, blue on white, 0.2 <i>shaku</i> in diameter, hemmed on a ground-piece with 0.23 <i>shaku</i> diameter.
	Good conduct badge.	^ shaped, 0.46 <i>shaku</i> in diameter, 0.04 <i>shaku</i> in width, a distance of 0.01 <i>shaku</i> between badges when more than one is worn, scarlet cloth on blue serge dress and blue on white dress. Gold on dress occasions, ground-piece of 0.49 <i>shaku</i> diameter, that for gold badges 0.52 <i>shaku</i> lined with satin, a ring attached.
	Badges for dress.	Gold embroidery, 0.2 <i>shaku</i> in diameter, ground-piece of 0.26 <i>shaku</i> lined with satin, a ring attached.
	Table-ware.	Enamelled iron vessels in set of 3, largest 0.54 <i>shaku</i> , medium 0.49, smallest 0.34 in diameter, and aluminium chop-sticks.
	Buttons (A).	Gilt on brass, larger ones 0.07 <i>shaku</i> , smaller 0.05 in diameter.
	Buttons (B).	Black horn, larger ones 0.07 <i>shaku</i> , smaller 0.05 in diameter.
	Black horn buttons.	Black horn with figures of anchor and cable in relief, 0.09 <i>shaku</i> in diameter.
	White horn buttons.	Plain white horn, 0.07 <i>shaku</i> in diameter.
	Blanket.	Stitched with white worsted, 7.3 <i>shaku</i> by 5.3, weighing over 730 <i>momme</i> , with anchor figured at corner.
	Cholera belt.	White flannel doubled, 4 <i>shaku</i> long, width in the middle 0.45 <i>shaku</i> , 2 buttons of white horn.

	Article	Material and Made.
Men in Prison	Lined blue garment.	Same as above, except wadding.
	Unlined blue garment.	Same as above.
	Blue shirts.	Light blue coloured cotton, with narrow sleeves, 2 <i>shaku</i> in length, otherwise same as wadded blue garment above.
	Blue belt.	Light blue coloured cotton, 3 <i>shaku</i> long.
	Wadded red garment.	Dark red coloured cotton, with narrow sleeves, otherwise same as wadded blue garment above.
	Lined red garment.	Same as above, except wadding.
	Unlined red garment.	Same as above.
	Wadded short garment.	Dark red coloured cotton, with narrow sleeves 2.2 <i>shaku</i> in length, wadded, with cotton wool of 60 <i>monme</i> in wadding.
	Lined short red garment.	Same as above, except wadding.
	Unlined short red garment.	Same as above.
	Lined red drawers.	Dark red coloured cotton of common make, 2.52 <i>shaku</i> in length.
	Unlined red drawers.	Same as above.
	Red shirts.	Dark red coloured cotton with narrow sleeves, 2 <i>shaku</i> long.
	Red belt.	Dark red coloured cotton, 3 <i>shaku</i> long.
	Apron.	Canvas, 1 <i>shaku</i> by 0.8, with a strap of 1 <i>shaku</i> .
	Socks.	Dark red coloured <i>tabi</i> of common make (dark blue sock may be used in common).
Protection against Cold.	Woolen comforter.	Same as "comforter" under (B).
	Woolen gloves.	Dark grey coloured worsted, lined with floss wool.
	Woolen shirts.	Black worsted, short sleeved.
	Puggery.	Blue broad cloth, lined with white flannel, buttons of zinc varnished black, five in number.
	Flannel drawers.	White flannel, of common make.
	Half boots.	Common make.
	Woolen stockings.	White woolen yarn knitting, 50 <i>monme</i> in weight.
	Overcoat.	Blue cloth, lined with white flannel, pockets of same material, sleeves lined with black twilled cotton, having hood, 3 <i>shaku</i> in length, pockets on both sides of the breast, with belt at the waist, and buttons figured with anchor and cable, made of black horn.

We concluded that when the war broke out, our fleets would be sent into northern waters with a rigorous climate, and that the clothing supplied to our men at ordinary times would be insufficient for protection against cold. Arrangements were therefore made that clothes for cold weather should be specially granted or loaned; and preparations for this end were already stated; but as such a vast quantity of clothes could not be finished all at once, Vice-Minister M. Saito communicated to the Commander-in-chief of the Combined Fleet on Jan. 16 as follows;—

“It is necessary that at this crisis our men and civilians who are to be dispatched to the regions around Korea, North China, and the Russian Maritime Province should be granted or loaned clothing for protection against cold; and suitable regulations will soon be published. The stuffs are now being bought and made up, and will be forwarded as soon as completed, to the Direction of Account and Supplies at Sasebo.

“You are hereby requested to bear in mind that until such a quantity of clothing shall have been provided at Sasebo as will be sufficient to supply the whole fleet, and until the publication of the said rules, delivery should be made to the ships and vessels of the fleet in the following order:

1. Destroyer and Torpedo-boat Flotillas.
2. Third Class Cruisers and below, as also Special Service Corps.
3. Second Class Cruisers.
4. First Class Cruisers and Battleships.
5. Special Service Ships.”

On Jan. 22, Naval Minister Baron Yamamoto published the Rules relating to the loan of clothing for protection against cold, as below:

“Men of the Navy, civilians attached, workmen, and coolies dispatched at this season to the regions about Korea, North China, and the Maritime Province of Russian Siberia, and remaining in that region, are granted loans of articles of clothing for protection against cold, according as they are needed for a period ending on March 31, of the current year, in accordance with the details given below:

“The above articles of clothing are supplied by the Direction of Accounts

and Supplies at the Sasebo Naval Station. Men of the Navy and civilians attached to the Army transport vessels, or else remaining in the Army, will be served at the Kure Naval Barracks; and those dispatched from home, at the Direction of Accounts and Supplies at the Sasebo Naval Station."

Article		Make	To Whom Loaned
Woolen comforter.....No.	1	White worsted, 6 <i>shaku</i> . long.	To those above warrant officers, midshipmen, probationary officers etc., civilians above <i>hanrin</i> rank and ranked equal to probationary officers.
Woolen gloves.....Pair	1	White worsted, lined with floss wool.	
Woolen shirt.....No.	1	Black worsted, long sleeved.	
Overcoat ...No.	1	Blue cloth, lined with white flannel, pockets, same material, lined with black, twilled cotton, made after armed sentry's overcoat, with hood, 3 <i>shaku</i> . in length pockets on both sides of breast, belt at the waist, near the end of sleeves striped with yellow line 0.05 <i>shaku</i> . in width, buttons of black horn.	Kept in stock for half the number of the above, and loaned when needed.
Woolen gloves Pairs	2	Dark grey worsted, lined with floss wool.	
Woolen stockings.....Do.	2	White worsted knittings, weighing 50 <i>monme</i> .	To petty officers and men, employes rated equally with petty officers and men.
Thick-soled blue socks.....Do.	2	Outside blue cotton, lined with white " <i>monma</i> ," triple soled.	
Woolen comforter.....No.	1	Same as "comforter" described in (B), Dress Regulations.	To the same as above, petty officers and men under (B) excepted.
Puggery ...No.	1	Outside blue cloth, lining white flannel, buttons of zinc, 5 in number.	
Woolen shirt, No. Flannel drawers.....Pairs	1 2	Black worsted, short sleeved. Common make.	To the same as above.
Short boots, Pair	1	Common make.	
Overcoat ...No.	1	Same in material and make as that for officers and warrant officers, excepting buttons which are of black horn with figures of anchor and cable and yellow stripe at the sleeve taken away.	To be kept in stock for 4 the number of the above, and to be loaned when needed.
Blankets ...No.	5	White woolen fabric, weighing 730 <i>monme</i> .	To petty officers and men on night service on deck on destroyers and torpedo-boats.

Article		Make	To Whom Loaned
Straw shoes, Pair	1	Made of straw, shaped like half-boots.	Necessary number kept to be loaned to warrant officers and men on night watch.
Knit gloves, Pairs	2	Same as "gloves" for armed sentries.	
Knit shirts...No.	2	Outside cotton yarn, lining of floss cotton.	To employés, workmen and coolies.
Drawers ...Pairs	2	Same as above.	
Blue socks ...Do.	2	Common <i>tabi</i> .	

Those on service in the Tsugaru Strait quarter and those at the watch-towers in cold regions are also granted loans of the same articles from the Direction of Accounts and Supplies at Yokosuka.

On June 22 an order was issued giving grants or loans of clothings for hot weather in the same manner as those for cold weather, as shown below:—

TABLE I. (Secretariat No. 2205, June 22, 1904.)

Article		Make	Grant or Loan
Puggery.....No.	2	Bleached thick cotton 12. <i>shaku</i> by 1.0.	Granted to petty officers and men.
Sennit hat ...No.	1	Same as the hat under (B), Detailed Regulations Enforcing Allowance Ordinance, Navy Department.	To petty officers and men not in possession of the same.
Summer hat, special make ...No.	1	Straw braid, crown 0.25 <i>shaku</i> high, brim 0.4 <i>shaku</i> wide, with cotton chin-stay.	Granted to petty officers and men on destroyers and torpedo-boats. In other quarters, only necessary quantity is provided and loaned to the sentry, those engaged in sea sweeping or to sentries on land.

TABLE II. (Secretariat, No. 2069, May 29, 1905.)

Article		Make	Grant or Loan
Hat .....No.	1	Same as that under (B), Detailed Regulations, etc.	Loaned to petty officers and men not in possession of hat as per Regulation.
Summer hat, special make ...No.	1	Straw braid, crown 0.25 <i>shaku</i> high, brim 0.4 <i>shaku</i> wide, with cotton chin-stay.	Granted to crews of destroyers and torpedo-boats, P.O., yeomen of signals, seamen, signalmen, sufficient number kept in ships and other quarters to be lent to sentries and men attending to the clearing of seas, patrol on shore, and such like service.

SECTION VII. IMPERIAL GIFTS.

Their Majesties the Emperor and Empress, Their Highnesses the Crown Prince and Princess, and T. H. the Imperial Princesses, were gracious enough to show their solicitude for the sailors at the front by sending their attendants with kindly words of inquiry and donations in kind and money for the sick and wounded in action, whereby every body was greatly moved. Indeed, Her Majesty the Empress, the Crown Prince and Princess, and other Princes and Princesses of the Imperial Family graciously condescended to manufacture with their own hands bandage rolls for dressings to be given to the wounded in action. And, furthermore, the Empress was so good as to give to sailors at the front as well as to the Russian wounded, who lost their limbs or eye-balls, artificial limbs and eye-balls. To meet the Imperial desires the Bureau of Medical Affairs most carefully attended to the business of distributing these Imperial Gifts. H. H. Princess Arisugawa, and other Imperial Princesses, also, gave bandages, etc., of their own make.

SECTION VIII. MEMBERS OF THE NAVY MEDICAL DEPARTMENT WHO SERVED IN THE WAR.

The medical officers of the Navy who served all through the war numbered 311 (probationary assistant surgeons included) ; apothecaries 19 ; head ward-masters¹ 1st class 9 ; head ward-masters² 2nd class 31, making altogether 370, 12 of whom were officers on the 1st reserve list called out.

Those who died in action were 8 medical officers on the active list and 1 head ward-master 2nd class ; those who were wounded and died while on duty (not in actual engagement) numbered 5 medical officers and 1 head ward-master, while the officers who died of illness, numbered three. Among the petty officers and men, sick berth stewards numbered 261, sick berth attendants 426, together making 687 (including those called out from the 1st and 2nd reserve) of whom the attendants recruited in the years 1904 and 1905 numbered 187. Of the stewards and attendants on the active list, there were 5 stewards and 9 attendants, together 14, who died in action.

¹ Commissioned officer.

² Warrant officer.

Besides the above, nurses hired at Naval Stations during the war numbered in the aggregate 420 ; and at the two hospitals, Sasebo and Kure, 4 Relief Parties of Red Cross Nurses were employed.

The Medical organization of the Navy during the war was as under:—

Medical officers (probationary assistant surgeons included)	311
Apothecaries	19
Head Ward-masters 1st Class.....	9
Head Ward-masters 2nd Class	31
S. B. Stewards	261
S. B. Attendants.....	613
Red Cross Nurses(4 parties)	104
Hired Nurses.....	420
Total :	1,768

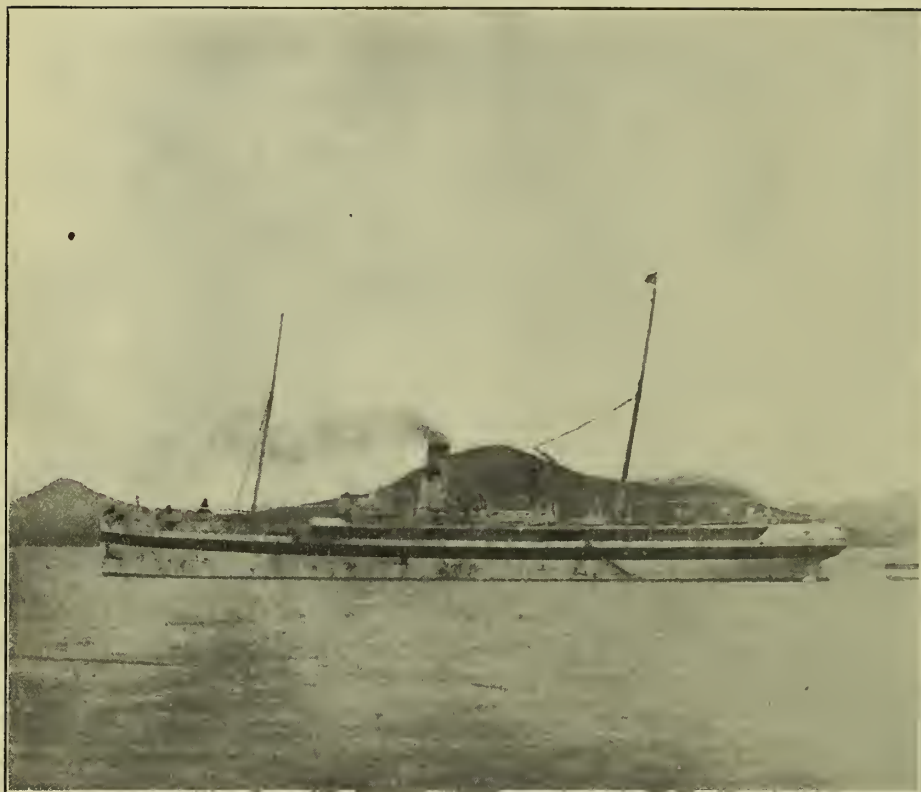
The following are the names of those members of the Medical Branch of the Imperial Navy who died in action:—

Casualties	Date	Official Rank	Name
<i>Hatsuse</i> , exploded and sunk	May 15, '04	Chief M.O. Fleet Surgeon	B. Seki.
<i>Hatsuse</i> , exploded and sunk	May 15, '04	Assistant Surgeon, 1st Class	H. Uemiyā.
<i>Hatsuse</i> , exploded and sunk	May 15, '04	Head Ward-master 2nd Class	Y. Yoshida.
<i>Hatsuse</i> , exploded and sunk	May 15, '04	S.B. Steward	T. Kono.
<i>Hatsuse</i> , exploded and sunk	May 15, '04	S.B. Attendant, 2nd Class	N. Niizato.
<i>Yoshino</i> , exploded and sunk	May 15, '04	Assistant Surgeon, 1st Class	R. Kusaka.
<i>Yoshino</i> , exploded and sunk	May 15, '04	Chief S.B. Steward	K. Fujimoto.
<i>Yoshino</i> exploded and sunk	May 15, '04	S.B. Attendant, 2nd Class	K. Matsuya.
<i>Yoshino</i> exploded and sunk	May 15, '04	S.B. Attendant, 2nd Class	M. Kawada.
<i>Akatsuki</i> , exploded and sunk	May 20, '04	Assistant Surgeon, 1st Class	B. Koike.
<i>Kaimon</i> , exploded and sunk	July 5, '04	S.B. Attendant 1st Class	T. Urata.

Casualties	Date	Official Rank	Name
Killed by a hostile shell on board a converted gun-boat...	July 23, '04	2nd Class Attendant	M. Sakai.
<i>Hayatori</i> , exploded and sunk	Sept. 3, '04.	Assistant Surgeon, 1st Class	K. Ishikawa.
<i>Heiyen</i> , exploded and sunk	Sept. 18, '04.	Chief M.O. Surgeon.	J. Nishiuchi.
<i>Heiyen</i> , exploded and sunk	Sept. 18, '04.	S.B. Steward 2nd class	J. Itakura.
<i>Heiyen</i> , exploded and sunk	Sept. 18, '04.	S.B. Attendant, 2nd Class	I. Uodзуми.
<i>Saiyen</i> , exploded and sunk	Nov. 30, '04.	S.B. Steward, 2nd Class	M. Hagiwara.
<i>Takasago</i> , exploded and sunk	Dec. 13, '04.	Chief M.O., Staff Surgeon	T. Kano.
<i>Takasago</i> , exploded and sunk	Dec. 13, '04	Surgeon.	H. Inagaki.
<i>Takasago</i> , exploded and sunk	Dec. 13, '04	2nd Class S.B. Steward	M. Imai.
<i>Takasago</i> exploded and sunk	Dec. 13, '04	S.B. Attendant, 1st Class	S. Kamon.
<i>Takasago</i> , exploded and sunk	Dec. 13, '04	S.B. Attendant, 2nd Class	K. Yagura.



NAVAL HOSPITAL SHIP *KOBE MARU*.



NAVAL HOSPITAL SHIP *SAIKIO MARU*.

CHAPTER. II.

THE HOSPITAL SHIPS.

SECTION I. BRIEF DESCRIPTION AND OUTFIT.

I. Brief Description.

On February 10th, 1904, the Japanese Government notified the Russian Government through the Government of the United States of America that it intended to put the two steam-ships, *Saikio Maru* and *Kobe Maru*, into the service of her Navy as Hospital Ships, for the sole purpose of giving relief to the sick and wounded, as well as to the ship-wrecked, in conformity with Article 1 of the Convention agreed upon at the Hague July 29, 1899, this being the practicable application to naval battles of the original principle of the Geneva Convention of August 22nd, 1864. Even prior to this, when a breach of the relations between Japan and Russia became imminent, our Authorities had already, with a view to emergencies, chartered the *Kobe Maru* of the Nippon Yusen Kaisha (Japan Mail Steamship Company, Ltd.), as a Hospital Ship, and had placed her in charge of the Kure Naval Station, as belonging to the Combined Fleet. Orders had also been given to have her properly equipped at the Kawasaki Dockyards in Kobe. A further step was made as soon as the rupture had actually taken place. Our Government then chartered the steamship *Saikio Maru* for similar employment as a second hospital ship, and orders were given to the Kure Navy Yard for the work of equipment to be taken in hand at once.

It was determined to give each of these ships an equipment sufficient for the reception of 178 patients. Work on the *Kobe Maru* was finished Jan. 26 ; on the *Saikio Maru*, Feb. 27.

Synoptical Summaries of the Hospital Ships.

Name	<i>Saikio Maru</i>	<i>Kobe Maru</i>
Official No.	1092	1105
Code letters	HGQF	HGRC
Tonnage		
Gross	2,904	2,877
Registered	1,644	1,623
Displacement.....	5,000	5,013
Freight tonnage		
Tons measurement	2,317	2,317
Tons weight	2,300	2,300
Dimensions		
Length	320.15 <i>shaku</i>	319.20 <i>shaku</i>
Breadth	40.30 <i>shaku</i>	40.30 <i>shaku</i>
Depth	18.92 <i>shaku</i>	18.87 <i>shaku</i>
Mean Draught		
Load Draught	20 ft. 5 in.	20 ft. 5 in.
Light Draught	13 ft. 3 in.	13 ft. 3 in.
Freeboard	10 ft. 4 in.	19 ft. 3 in.
Construction	Heavy deck vessel	Heavy deck vessel
Object of use	Freight and passengers	Freight and passengers.
Number of masts	2	2
Lightning rods.....	2	2
Number of funnels	1	1
Height of main-mast, (measured from the upper deck to the upper mast-head)	111 ft.	111 ft.
Rig	Schooner	Schooner
Stem.....	Straight vertical	Straight vertical
Material of the hull.....	Steel	Steel
Colour of the hull	Black	Black

Number of gangway ladders	3	3
Number of decks	3	3
Number of transverse bulkheads...	6	6
Bottom	Partial double bottom	Partial double bottom
Engine	Triple expansion 1	Triple expansion 1
Main boiler, class and number	{ Double cylinder 2 Single cylinder 1	{ Double cylinder 2 Single cylinder 1
Maximum steam-pressure	1b. 180	1b. 160
Auxiliary boiler		
Class and number.	Single cylinder 1	—
Kind of water used in boilers.....		
Main-boiler	Fresh water	Fresh water
Auxiliary boiler	Fresh water	Fresh water
Dynamos		
Number	1	1
Steam-pressure	1b. 60	1b. 80
Voltage	55 volts	55 volts
Ampere	270 amperes	270 amperes
Propeller	single	single
Horse-power		
Nominal	387	387
Indicated	3,327	2,575
Speed.		
Highest.....	14.43 knots	14.0 knots
Ordinary	12.0 knots	11.7 knots
Date of launching	June, 1886	August, 1886
Stated routes.....	Neighbouring seas	Neighbouring seas
Place of construction	England	England
Cost of building or price of		
purchase	492,603 <i>yen</i>	488,629 <i>yen</i>
Coal storage.....		

Name	<i>Saikio Maru</i>	<i>Kobe Maru</i>
For ordinary use.....	440 tons	440 tons
Reserve.....	—	—
Fresh water storage		
Drinking water tank	27 tons	27 tons
Tank furnished with feed pipes to boiler	141 tons	144 tons
For drinking, when needed...	—	—
For other uses	346 tons	346 tons
Boiler water up to working level...	110 tons	94 tons
Amount of consumption in 24 hours at ordinary speed		
Coal	64 tons	63 tons
Cylinder oil	0.4 gallons	0.4 gallons
Engine oil	6.3 gallons	4.3 gallons
Lighting oil	0.75 gallons	1.1 gallons
Waste cotton	5.4 <i>kin</i> (pound)	2.8 <i>kin</i> (pounds)
Boiler water.....	16 tons	20 tons
Distiller and evaporator		
Number of Distillers	1	1
Amount distilled per diem ...	2,500 gallons	2,000 gallons
Number of pumps		
For sea-water	3	3
For fresh-water	2	2
Portable	1	2
Steering engines		
Worked by hand	1	1
Worked by steam	1	1
Windlasses		
Worked by hand	1	1
Worked by steam	1	1

Ice machine	Carbon dioxide machine	Carbon dioxide machine
Capacity of cold Storage room.....	500 cub. ft.	577 cub. ft.
Incandescent lights (Number)	$\left\{ \begin{array}{l} 4 \text{ of } 50 \text{ c.p.} \\ 4 \text{ of } 32 \text{ c.p.} \\ 248 \text{ of } 16 \text{ c.p.} \end{array} \right.$	$\left\{ \begin{array}{l} 13 \text{ of } 50 \text{ c.p.} \\ 194 \text{ of } 16 \text{ c.p.} \end{array} \right.$
Motors		
Number	22	27
Horse power.....	.07	.07
Use	Ventilation	Ventilation
Winches		
Winches		
Number	2	2
Power	3 tons	3 tons
Derricks		
Number	2	2
Length	$\left\{ \begin{array}{l} 29 \text{ ft. } 5 \text{ in.} \\ 37 \text{ ft. } 5 \text{ in.} \end{array} \right.$	$\left\{ \begin{array}{l} 29 \text{ ft. } 5 \text{ in.} \\ 37 \text{ ft. } 5 \text{ in.} \end{array} \right.$
Maximum hoisting power attained by a special device on the ships	5 tons	5 tons
Boats provided		
Steam-launch.....	—	—
Life-boats	4	4
Cutters	2	2
Gigs	1	1
Jolly boats	1	1
Number of passengers 1st class		
Number	52	52
Number of sofas	24	24
2nd class		
Number	24	24

Name	<i>Saikio Maru</i>	<i>Kobe Maru</i>
Number of sofas	6	6
3rd class		
Number	165	177
Number of bath-rooms		
For 1st and 2nd classes	6	6
For 3rd class	—	1
For the crew.....	3	1
Number of closets		
For 1st and 2nd classes	{Stools 9 Urinals 10	{Stools 10 Urinals 10
For 3rd class.....	{Stools 4 Urinals 1	{Stools 4 Urinals 1
For the crew	{Stools 6 Urinals 2	{Stools 6 Urinals 2
Full number of the crew		
Captain and mates	4	4
Chief engineer and engineers...	4	4
Purser and clerks.....	3	2
Deck-hands	22	22
Engineer-branch	30	30
Other members	36	36
Boiling of rice		
Quantity of rice to be boiled		
at a time	2 to 4 <i>sho</i>	2 to 4 <i>sho</i>
Time required for one boiling	50 minutes	50 minutes
Maximum number of persons to be taken on the main and lower decks	542	520
Hatches		
Number and size	2, the one of 16×10 ft. the other of 8×8 ft.	2, the one of 16×10 ft. the other of 8×8 ft.

II. Equipment.

We have here described the equipment of the two vessels—*Saikio Maru* and *Kobe Maru*—for hospital services. The details were almost the same in each, and the reader will therefore remember that the following statements apply equally to both ships, excepting where the names are specially mentioned.

The Hurricane Deck.

The equipment of this deck consisted of a small steam-launch and boats, of water tanks and of hatches and davits for taking patients into or out of the vessel.

Small Steam-launch and Boats :— Aft the skylight of the boiler-room on the port side there hung a small steam-launch, and two boats on the starboard side, each supported by proper backing and stanchions.

Promenade for Patients :— The after part of the deck aft of the funnel (the so-called hurricane deck) had originally been intended as a promenade for 1st class passengers. This section was now appropriated for the use of the patients.

Water Tank :— Just in front of the funnel there was originally a sanitary-tank. This provision was now doubled by the instalment of a second additional tank.

Arrangements for lifting Patients :— On the *Kobe Maru*, the quarter boat davits on both sides were available for hoisting in patients on stretchers from boats. For this purpose, a hatch was cut in the side of the hurricane deck to admit of swinging in a davit or tackle. And the derrick of the foremast was made use of in taking on board patients for the fore-part of the ship.

On the *Saikio Maru*, it was first planned to make use of the derricks of the quarter boat-davits belonging to Nos. 7 and 8 life-boats in lifting up and letting down serious cases, but the plan was modified in accordance with a suggestion from the chief surgeon of the ship.

The after-davits of Nos. 7 and 8 life-boats on both sides aft on the hurricane deck were used as pivots, with a derrick 4.3 *shaku* in length, and 0.3 *shaku* in diameter, fixed in such a manner as to revolve horizontally ; and part of the side of the hurricane deck was cut away to the extent of 2.2 *shaku* in width and 1.8 *shaku* in

length just behind the after-davit, so as to give room for swinging in the tackle belonging to the derrick. When taking patients aboard, the derrick is swung out over the ship's side by pulling the fore-guy, and the stretcher, when fastened to the tackle, is hauled up with the tackle-fall. At the moment the stretcher goes over the bulwark of the upper deck, the after guy is pulled, the derrick swings back, and the tackle, coming in through the hatch of the hurricane deck, brings patient and stretcher on to the upper deck.

This proved to be a most convenient device for taking patients on board the ship, but experience showed that there were still a few defects which had to be removed by further reconstruction. In the first place, the length of the hatch in the hurricane deck was at first no more than 1.8 *shaku*, and there was often a consequent trouble when the tackle got caught by the corner of the hatch.

To remove this defect, the hatch was enlarged and the corners rounded off, an improvement which made the work of lifting patients on board somewhat easier.

The hatch was however still felt to be too narrow. The rail too that fastened the incised part had originally been made to fold back towards the bow. This prevented the free action of the leading block and so it was found advisable to make it fold back towards the stern. Secondly, the hook of the lower block, being originally an ordinary single hook, there was always the danger of the hook parting company with the stretcher whenever the latter came into sudden collision with some other object, as frequently happened e.g. when the waves were high. Single hooks were therefore replaced by clasp-hooks. Thirdly, the original fall which was of hemp ropes had the defect of getting gradually stiffened with use. This of course proved to be extremely inconvenient, so the hemp ropes were superseded by Manila ropes. Fourthly, the port for the stretcher to come in by, which lay between the davit and stanchion, was no more than 5.2 *shaku* in width and 4.8 *shaku* in length. Consequently, the stretcher which was 9 *shaku* long and 2.5 *shaku* wide had naturally to be tipped on one side while passing through the port, much to the discomfort of the patient. The port should be at least 6 *shaku* across, and it should be so constructed (by removing or cutting bulkheads if necessary) as to be capable of being thrown open to its widest extent. The length of the bamboo poles of the stretcher is usually 9 *shaku*, but these proved too long and unmanage-



TAKING PATIENTS ON STRETCHERS ABOARD SHIP. *KOBE MARU*.





HATCH DEVICE ON HURRICANE DECK FOR
HOISTING PATIENTS ABOARD SHIP. *SAIKIO MARU.*



able for ship-board use, and were cut down to 8 *shaku*. The aft and fore hauling ropes of the stretcher were of the same length at first, but it was soon found that the fore ropes were more strained by the heavier weight of the upper half of the patient's body than the after ropes. For this reason, the fore ropes were subsequently made shorter than the aft ones by 0.5 *shaku*. They were also coloured black to distinguish them from the other ropes. By these contrivances it became possible to keep the stretcher in a horizontal position while lifting. The authorized stretcher was found suitable for use on the ships, its only defect being that the pillow is sewed on to its edge and is apt to get loosened and elongated so as become almost useless for the purposes for which it was intended. We believe it can be improved by making it circular in form, and of such a shape that it can be tied and tightened freely by means of slender strings coming out from under the bed of the stretcher. It should be added that the iron rings on the cross bars were so flimsily made that more than half of them got broken.

The Upper Deck.

The alterations on the upper deck, beginning from the after part, were as follows :—

Mortuary :—The bath-room for cabin passengers on the port side of the quarter-deck was used as mortuary after some reconstruction. The entrance was enlarged to the width of 3 *shaku* by cutting away part of the iron-plate on one side. To give facilities for washing, a tube provided with a stop-cock was supplied to conduct sea-water into the room. The floor was of tiles as before, and was covered with gratings. The room had a couple of scuttles 92 *shaku* in diameter.

The Preparing and Operating Rooms :—The partition between the smoking-room and 2 cabins adjoining in the after part on the port side was removed so as to amalgamate the two rooms into one, and a new partition was put up in the middle of the amalgamated room so as to divide it into two apartments of the same size. The fore-room was intended to be used as the operating room, and the after-room as a preparing room for patients before operation. The floor was covered with linoleum, and the walls of the rooms were all washed with white paint.

The entrance to the preparing room which had originally been a hinged door was now changed to a sliding one 4 *shaku* in width; the passage to the surgeries was enlarged and made a hinged door 3 *shaku* in width, the upper half of it

being glazed with frosted glass. On the ceiling of the room were furnished a couple of incandescent lights of 16 c.p., and on the walls of the right corner in the fore-part of the room were fixed two cisterns of sterilised water, one for cold water and the other for warm. As the inner wall of the room forms part of the side-wall of the sky-light which passes directly from the hurricane deck to the main deck, the said inner wall was partially cut away at its after and lower part to the extent of 7.5 *shaku* in length and 3.75 *shaku* in height, and two sliding doors being provided the opening was used as a passage for patients up from or down to the surgical ward on the main deck. This was done by means of an elevator. A water sterilizer was fitted up on the part of the wall which formed the back of the sky-light mentioned before. It had a capacity of 195 litres, a steam pipe, an air-escape pipe, a water-gauge, and a hole for insertion of a thermometer. Besides the above, there were provided in the room an operating table, an instrument table of glass, irrigating bottles, a wash-stand and sink, a steam heater pipe, electric lights and fan. The room had 4 ports and the ceiling had 2 ventilators 5 *shaku* in diameter, so that ventilation and light were both favourable.

The Operating Room:—It was just in front of the preparing room. The apartment had a space of 1,010.87 cubic *shaku* and was provided with a wash-stand and sink, an instrument cabinet, a couple steam-heater pipes, 7 incandescent lights, an electric fan, a sterilizer for surgical instruments, an operating table, irrigating bottles, a wash-basin with stand, iron-stools to be used during an operation, and 3 instrument tables. The apartment had 3 entrances, one on the after side and two on the outer side, the former communicating with the preparing room; 9 ports and one sky-light. In addition to the above, there were 2 ventilators 5 *shaku* in diameter.

The Elevator for Surgical Patients:—It was fitted up in the space between the preparing room and the pathological and bacteriological laboratory on the port side. The elevator was a wooden frame something like a bedstead 6.75 *shaku* in length, 2.85 *shaku* in width, and 0.65 *shaku* in depth. Down the middle each of the fore and aft extremities was fixed a grooved wooden plate into which a wooden stopper 0.26 *shaku* in diameter could be fitted, and the elevator was so devised

NAVAL HOSPITAL SHIP *KOBE MARU*. OPERATING ROOM.



NAVAL HOSPITAL SHIP *SAIKIO MARU*. OPERATING ROOM.



as to slide up and down by means of a hand-winch. To this apparatus a room-stretcher is attached.

The Sterilizer for Dressing Materials and the Shoot for Garbage and Waste Material :—On the *Kobe Maru*, the water-closet and lavatory on the starboard side in the quarter were reconstructed for the above purposes. In so doing, the deck was newly covered over with lead plates. On the *Saikio Maru*, these places were remodelled and made into an infectious ward for officers, the room being provided with three wooden bedsteads, one incandescant light, and an electric fan. As to the shoot for waste material, it was specially fitted up just in front of the mortuary on the starboard side; and the sterilizer for dressing materials was placed under the port side ladder just behind the preparing room. This instrument, by the way, consisted of round double jackets 2.25 *shaku* in height and 1.45 *shaku* in diameter.

The Pathological and Bacteriological Laboratory, the Dark-room, the Chemical Laboratory, and the Room for the Repair of Surgical Instruments :—For the several purposes above mentioned, three of the cabins on the starboard side opposite to the preparing room were appropriated. The pathological and bacteriological laboratory had its ports enlarged, and also had fixed-chairs, water-pipes, a wash-stand, and a sink. A part of the room for the sterilizer for dressing materials was assigned as a place for manufacturing culture media.

In the *Kobe Maru*, an apartment just in front of the bacteriological laboratory was set apart as a dark-room, while in the *Saikio Maru* there being no dark-room specially provided, the X-ray room on the larboard side in the afterpart of the main deck was used for the purpose of a dark-room also.

For the repairing room and the chemical laboratory an apartment over against the dark-room was set apart for these purposes in the *Kobe Maru* and a room corresponding to the dark-room in the *Kobe Maru* was used for the same purposes in the *Saikio Maru*.

The Dispensary :—In the *Kobe Maru*, the original dispensary on the starboard side amidships and the chief mate's room adjoining the above were made one by removing the partition between them, and furnished with medicine shelves, a dispensing table, water-tubes, a sink and electric lights, and the room was used

as a dispensary. In the *Saikio Maru*, one corresponding to the repair room in the *Kobe Maru* was used for the same purpose.

The Rooms for the Surgeons, Apothecaries, and Chief Paymaster :—In the *Kobe Maru*, four rooms on the starboard of the after part of the ship and three rooms on the port side were appropriated for the use of the above officers, that is, one for the chief surgeon, three for the surgeons, one each for the chief paymaster and the apothecary, the remaining one being reserved as a spare cabin. In the *Saikio Maru*, three rooms on the starboard were set apart, two for the use of the surgeons and one for the use of the chief paymaster, and the three rooms on the larboard were set apart, one each for the chief surgeon and the apothecary, the remaining one being reserved as a spare cabin.

The Officers' Mess-room :—The social hall of the merchantship was used for the purpose. The hall measured 2,135 cubic *shaku* in capacity, had four glass windows and one sky-light, and was furnished with six electric lights, an electric fan, a steam-heater, etc.

The Canteen :—In the *Kobe Maru*, what had been the hair-dressing room on the port side amidships, and in the *Saikio Maru*, the old pantry on the port in the fore of the main deck were reconstructed and converted into canteens.

The Consulting-room for Out-patients :—This was provided on the starboard side amidships.

Mess Racks for the Patients :—They were placed in front of the consulting room for out-patients on the starboard side amidships.

The Paymaster's Office :—The former articulated pupils' room on the port side amidships was used for this purpose.

Store Room for Fresh Provisions :—The vacant place behind the flight of steps leading to the middle class room was utilized.

The Laundry :—On the *Kobe Maru*, an apartment 37 *shaku* in length, 9 *shaku* in breadth, and 8 *shaku* in height, was built of wood on the port side in the fore-part, and was furnished with washers, steam mangle, circular wringer, drying stove, ventilators, a water boiler, etc., and the deck was covered with zinc plates. On the *Saikio Maru*, similar arrangements were made on the port side in the fore-part of the ship.

The Drying Room Attached to the Laundry :—On the *Kobe Maru*, a wooden room 40 *shaku* in length, 9 *shaku* in breadth and 8 *shaku* in height was specially constructed on the starboard side in the fore-part, and the room was divided into two, the front section being used as a drying place. On the *Saikio Maru*, a similar room was constructed on the port side in the fore-part of the ship, the after section of this being likewise used as a drying place.

The Steam Disinfecter Room :—On both the *Kobe Maru* and the *Saikio Maru*, the fore section of the drying room last mentioned was set apart for this purpose. The section was again separated into two smaller compartments—the infected and non-infected—which were respectively used for storing things either awaiting disinfection or already disinfected. The deck was covered with zinc plates and the walls all around were also covered with the same material to a height of 1.5 *shaku* from the floor.

The Middle Deck.

The Officers' Sickrooms :—On the *Kobe Maru*, first class cabins, four on the starboard and three on the port side, all in the stern, were used for this purpose. With a view to prevent any excessive elasticity of the bedsteads, a steel plates 3 *shaku* long and 5 *shaku* broad was placed under each spring. On the *Saikio Maru*, first class cabins, three on the starboard and one on the port, and one waiting-maids' room, all aft, were used for the same purpose. Of these rooms, the two on the starboard were provided with superimposed bedsteads. Each room was furnished with fixed wooden bedsteads, a chair, a wash-stand, electric lights, an electric fan, and each sick-room had two scuttles and one ventilating hole.

The Surgical Ward :—A large hall was made for this purpose by amalgamating two first class passengers' cabins on the port, six cabins on the starboard and the dining-room for the first class passengers, all aft, and the deck was covered with linoleum. The hall measured 37.2 *shaku* in its longest width and 32.75 *shaku* in the shortest width, and 44.8 *shaku* in fore and aft length, and 7.05 in height. Its capacity was 16,704.34 cubic *shaku*. The room had on its front side two entrance each 5.9 *shaku* in height and 3 *shaku* in width, so that a stretcher could easily be taken through. At the aftmost part of this ward and

just under the steering engine room was furnished an arch-shaped bench for the patients to take rest on and smoke. The hall had on each side eleven scuttles 1.2 *shaku* in diameter; and around the smoking place there were six scuttles of the same size. In the middle part of the ceiling was a big sky-light 3.75 *shaku* in width, and running through the whole length of the hall (from fore to aft). Between the sky-light and the ship's sides there were on either side four rectangular ventilating holes 1 *shaku* wide and 1.5 *shaku* long; and on each side of the stove at the centre of the hall were 2 ventilating tubes 1.2 *shaku* in diameter, which had many branches running along the ceiling down the ship's sides and opening at several places. A steam-tube for heating the room was conducted along the bottom of the four walls, just encircling the room. To enumerate other items of equipment, there were eleven electric lights, 5 electric fans, a drinking water filter, a table for serving food, a mess rack, shoe-boxes, etc. The bunks, double banked, 39 in number, were arranged in 7 parallel rows from fore to aft, the spaces between the rows, which were 3.7 *shaku* wide at the broadest part, and 2.2 *shaku* at the narrowest, forming passages. The bunks were of wood varnished over with *Shunkei-nuri* lacquer; they measured 6 *shaku* in length, 2 *shaku* in width, 0.8 *shaku* in height. They swung on pivots, connected with single wooden stanchions fore and aft, and were superimposed one on the other with a space 1.9 *shaku* between them, and a maximum inclination of about 20 degrees. At the head and foot of the bunks, at the base, an arrangement was made for putting in pegs to check the swinging motion when required. The stanchions were supported between the decks above and below, and were fixed at their base by wooden plates nailed to the deck. At the head of each bed was hung a small wooden box 0.32 *shaku* by 0.65 by 0.25 to keep a few personal articles of daily necessity in; but as these boxes proved too small for actual use, they were replaced by somewhat larger ones made of metal.

The Bath-Rooms and Closets for Surgical Patients:—For these purposes, the ones on the main deck originally intended for the use of cabin passengers were employed, while for officer patients the ladies' bath-rooms and closets in the after part of the deck were assigned.

The X-ray Room:—On the *Kobe Maru*, a cabin just in front of the officers'

sickroom in the aft part, port, was set apart for the above use, and it was provided with a coil-stand and an examination-table. On the *Saikio Maru*, the X-ray room was obtained by amalgamating 2 rooms which lay at the place corresponding to the site of the same room in the *Kobe Maru*. The capacity of the room was 935 cubic *shaku* that is, double the capacity of the room on the *Kobe Maru*, and the room had four scuttles and five ventilating holes. In both the ships, all the furniture in the room was painted black; the scuttles and entrances were screened with black curtains, and the upper surface of the tables was also covered with the same black cloth.

The Surgeons' Office :—The former purser's office of the merchant ship on the port side amidships was appropriated for this purpose.

The Cell for the Insane :—This was a cabin originally intended for the use of the 2nd class passengers on the port side of the engine-room in the middle part, which was now reconstructed for the present use. It measured 359 cubic *shaku* in its actual capacity. The floor was covered with linoleum. On the left side of the entrance there was provided a small opening for passing medicines and food, and for vigilance purposes. On the right side of the entrance a closet in foreign style was provided, the basin for receiving discharges was so devised as to be drawn out from the outside and cleaned away from time to time. The inner walls and ceiling of the room were well padded with straw covered with canvas. The room had a ventilating hole and a scuttle, and the electric light placed high up was protected by a strong frame-work.

The Spare Sickrooms and Head Ward-Master's Cabin :—There were provided two spare sickrooms on the port side and three others on the starboard all beyond the insane cell, and a cabin for the Head ward-master was located in the fore-part larboard.

The Medical Ward :—On the *Kobe Maru*, the steerage passengers' room in the fore-part of the main deck was used for this purpose. The walls were covered with wooden plates which were painted white, the deck was covered over with linoleum; and there were provided six electric lights of 16 c.p. and thirty six of double bunks. The arrangement of the beds was as in the surgical room. The capacity of the room was 9,936 cubic *shaku*. By way of facilitating the receiving of

patients, a ladder was furnished to the cargo-port at the back of the room. The dining room of the 2nd class passengers just behind the ward was used as a dining room for the patients. On the *Saikio Maru*, the space for the steerage passengers in the fore-part of the main deck was remodelled for about two-thirds of the larboard side and was used as the medical ward. The floor was covered with linoleum. The room was 24.8-24 *shaku* wide, 6.0 *shaku* long., 7.26 *shaku* in height; and the capacity was 10,124.23 cubic *shaku*. At the back were two entrances, one of which led to the hatchway leading to the berths of the petty officers and men, and the other to the dining-room of the 2nd class passengers. At the back of the room there was a cargo hatch 10.5 *shaku* in transverse diameter and 7.65 *shaku* fore and aft, which was furnished with a grating; and just above the hole there was a sky-light to match it. In the foremost part of the room was a locker for surgical articles, 6. *shaku* high, 10. *shaku* wide, and 1.5 *shaku* in depth. Right behind the place was a hatchway furnished with a ladder which communicated with the upper and lower deck. Above this ladder was a sky-light. Besides, around the fore-mast which passes through the centre of the ward there was arranged a shelf possessing 46 holes of several sizes for holding medicine bottles. In the port side there were five scuttles. The cargo-port in the aft-part of the same side was used as the receiving place for patients. Other things provided were a heating tube, a ventilating tube, seven electric lights, an electric fan, a filter for drinking water, an examination sofa and a mess rack. Double-banked beds 22 in number were arranged in five rows from front to back. A part on the starboard side of the room was partitioned off with a wooden wall and was set apart as the infection ward.

The bath-room and lavatory for medical patients were located in the foremost part on the larboard, and it was furnished with a wooden bath tub and 2 small wash basins.

The Infection Ward:—On the *Saikio Maru*, about one-third of the apartment for the steerage passengers in the fore-part of the main deck was rebuilt to serve for this purpose. It was completely separated from the medical ward by a wooden wall. It had two doors, fore and aft. The ward was divided into three smaller ones which ran parallel to one another transversally. Of these

three, the aftermost room had an air space of 964.56 cub. *shaku*, and was provided with four beds. The deck was completely covered with leaden plates to facilitate disinfection. The room had two scuttles, and the inner wall had a glass-window. Other items of equipment were a steam heating tube, an electric light, and an electric fan connector. The middle room had capacity of 860.97 cubic *shaku*, and was provided with four beds. The foremost and smallest room with a space of 748.29 cub. *shaku* had three beds in it. The middle and front ones were fitted up just as the aftermost room was. The three rooms communicated with one another by means of a passage 2.8 *shaku* wide. At the aft part on the larboard side was the port for receiving patients, and the bath and the closet of the patients lay right behind the port just mentioned.

On the *Kobe Maru*, the infection ward was situated at the fore part on the lower deck. Its capacity was 4,797 cubic *shaku* which is equivalent to 265.5 cubic *shaku* per bed. The walls around and the ceiling were covered with wooden plates; the deck was faced with concrete. The ward was divided into five smaller ones, the middle one being used as the office of the sick-berth attendants. The two rooms on each side of the middle apartment were again divided into two and provided with 18 beds and four sky-lights; and each room had ventilating holes freshly perforated in the upper part, and an incandescent light and an electric fan.

The Lower Deck.

We shall now write about equipments on the lower deck from aft to fore. On the *Kobe Maru*, the clothing store and provision room lay in the middle of the 3rd hold in the aft-part, with the medical store-room on the port, and the nutritious food locker on the starboard side. On the *Saikio Maru*, the nutritious food locker, and the store rooms for medical and surgical use lay on the port side, and the bag rack and medicine store on the starboard. In both ships, right behind the engine-room lay the cold storage room on the port side, and the ice-making tank on starboard, and in the fore-part on the port side of the engine-room was set the ice-machine, a carbon dioxide machine of 1,355 pounds per diem capacity.

The 2nd hold just forward of the engine-room bulkhead was used as the attendants' room, furnished with hammock hooks, bag rack, ditty box racks and

mess racks enough to meet the demand of 45 persons. The room had a capacity of 9,577 cubic *shaku*, and was provided with eight scuttles, one ventilator, electric lights, a filter of drinking water, etc.

The first hold in the fore-part was used as the infection ward on the *Kobe Maru*, and as a spare sick ward on the *Saikio Maru*.

Ventilation Devices.

On the hurricane deck and the upper deck there were provided thirty-one ventilators of several sizes, fifty-four swan-neck ventilators, thirty-one mushroom-head ventilators and eight square sky-lights, to facilitate the ventilation of all the rooms on each deck. The thirty-one ventilators above mentioned were for taking air in, the rest for expelling it. There were also 6 wind-sails provided for conveying air to each room during the summer.

In conformity with Article V. of the Convention which applies to naval engagements the principles of the Geneva Convention concluded on August 22nd, 1864, the hospital ships had their sides washed white, with a green belt of $1\frac{1}{2}$ metres in width, as a distinctive mark showing the nature of their employment. The following diagrams shows the equipments of our hospital ships.

SECTION II.—THE MEDICAL STAFF.

It being desirable to secure promptness and regularity of work on board the Hospital-ships, a Station Bill with division of duties was drawn up beforehand for the accommodation and allotment of patients, for general fire stations and for taking to boats in times of danger, and these arrangements were put into execution at the earliest opportunity.

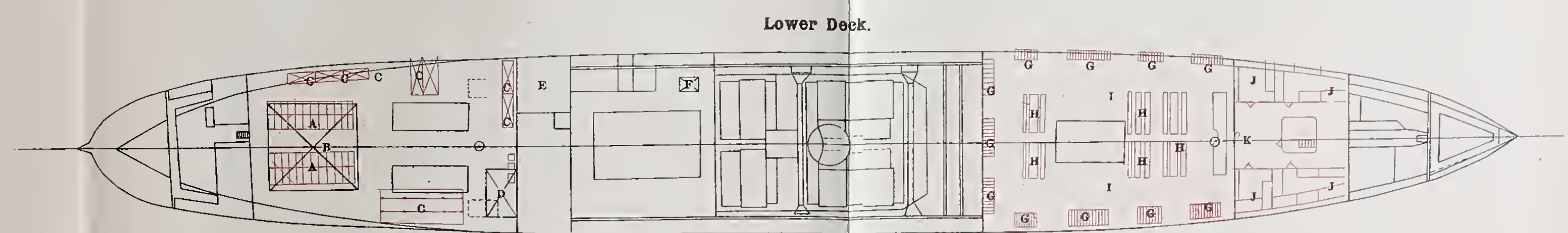
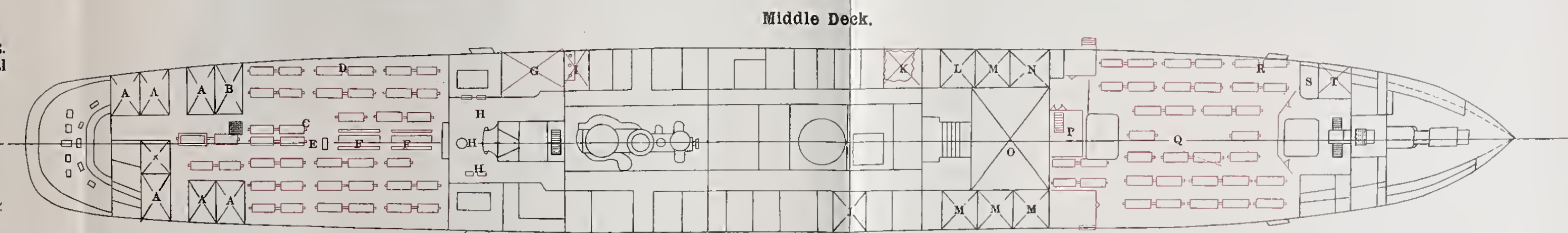
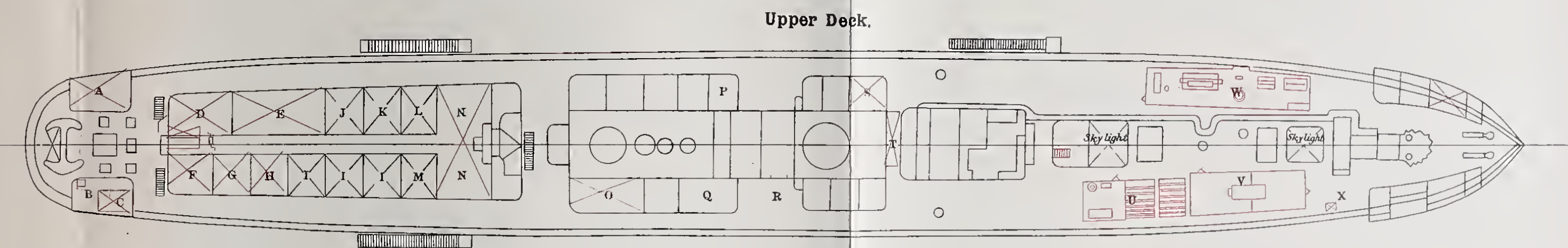
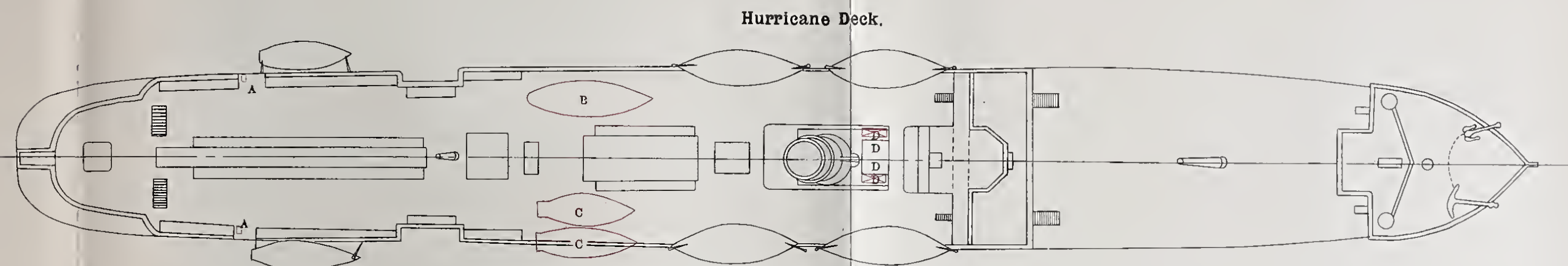
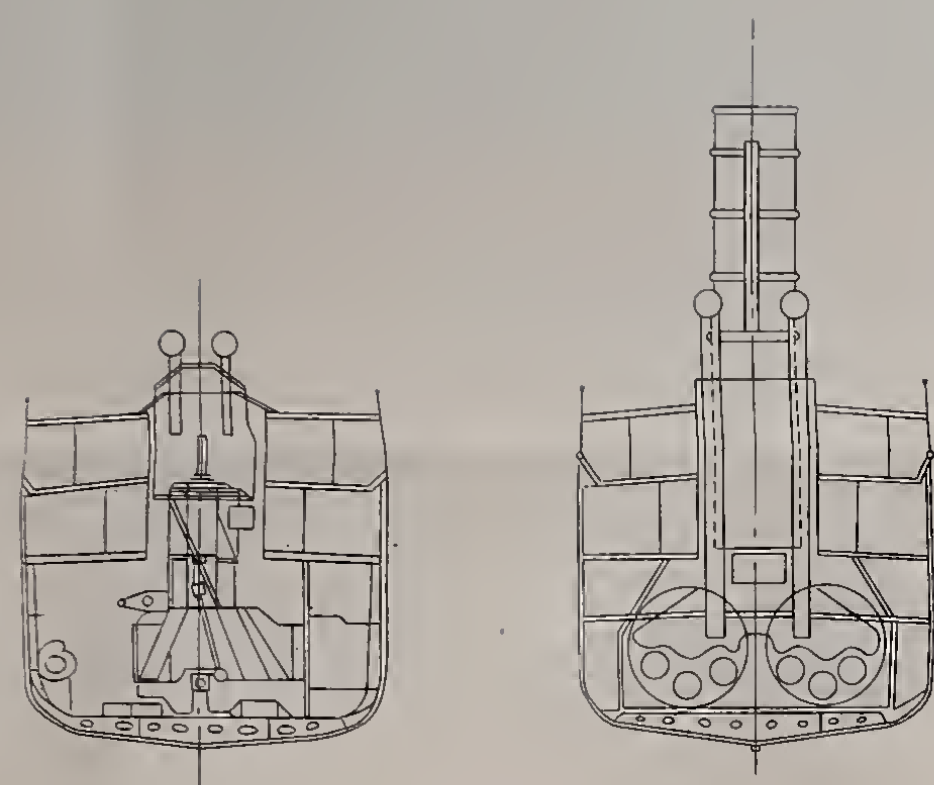
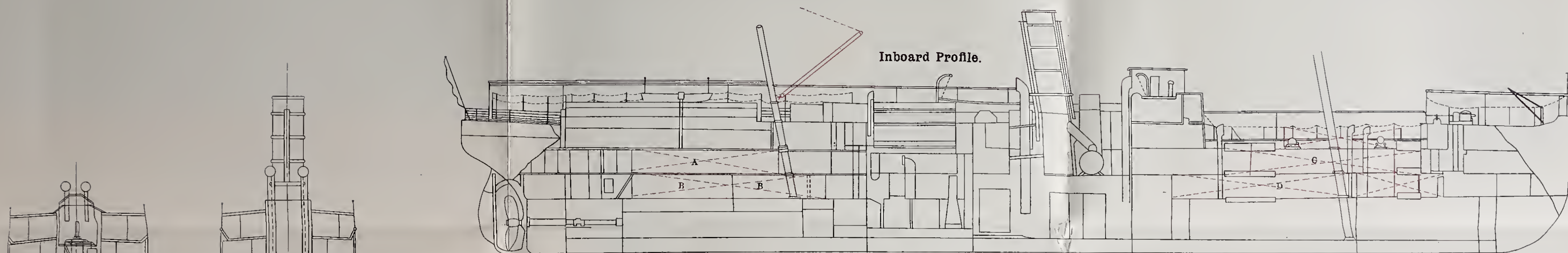
The regulations respecting the duties of the officers were as follows :—

The senior surgeon was to look after the training of probationary assistant surgeons, of sickberth stewards and attendants, the arrangement of the surgical wards and operation room, the custody of the medical history sheet, the disposition of personal affairs relating to sickberth stewards and attendants and employés, and of all matters concerning the construction and repairs of rooms in and of steam-boats belonging to, the ship.

The stated duties of the junior surgeons were the practical guidance of pro-

IMPERIAL JAPANESE NAVAL HOSPITALSHIP KOBE MARU.

Scale $\frac{1}{384}$. The reconstructed parts are shown in red lines.



Inboard Profile.

- A. Surgical ward.
- B. Medical storeroom.
- C. Medical ward.
- D. Crew space (S.B. attendants' room).

Hurricane Deck.

- A. Hatches for hoisting and lowering seriously wounded cases.
- B. Small steam launch.
- C. 7 meter boats.
- D. Water tank.

Upper Deck.

- A. Mortuary.
- B. Sterilizing room for dressing material.
- C. Shoot for garbage and waste material.
- D. Room for preparing patients for operation.
- E. Operating room.
- F. Pathological and bacteriological laboratory.
- G. Dark room.
- H. Chemical laboratory and room for sharpening instruments.
- I. Surgeon's rooms.
- J. Spare cabin.
- K. Apothecary's room.
- L. Paymaster's room.
- M. Chief surgeon's room.
- N. Officers' mess room.
- O. Dispensary.
- P. Canteen.
- Q. Consulting room for out-patients.
- R. Mess rack.
- S. Paymaster's office.
- T. Storeroom for vegetables.
- U. Drying room for clothes.
- V. Steam disinfectant.
- W. Steam laundry.
- X. Shoot for garbage and waste material.

Middle Deck.

- A. Officers' sick rooms.
- B. X-ray room.
- C. Surgical ward.
- D. Double banked beds.
- E. Stove.
- F. Dining tables.
- G. Surgeon's office.
- H. Serving tables.
- I. Lavatory.
- J. S.B. stewards' room.
- K. Insane cells.
- L. Senior S.B. steward's room.
- M. Spare sick wards.
- N. Head ward master's room.
- O. Mess room for head ward master, S. B. stewards and seamen's branch of equal rank.

- P. Ladder to crew space.
- Q. Medical ward.
- R. Double banked beds.
- S. Mess rack for medical ward.
- T. Bath and lavatory for medical patients.

Lower Deck.

- A. Storerooms for provision and clothing for patients.
- B. Bag racks for 208 bags.
- C. Medical storerooms.
- D. Ice making tank.
- E. Cold storage room.
- F. Ice machine.
- G. Bag racks for 268 bags.
- H. Dining tables.
- I. Crew space (S.B. attendants' room).
- J. Infection sick wards.
- K. Pump for drains.



IMPERIAL JAPANESE NAVAL HOSPITALSHIP SAIKIO MARU.

Scale $\frac{1}{384}$. The reconstructed parts are shown in red lines.

Inboard Profile.

- A. Surgical ward.
- B. Medical storeroom.
- C. Paymaster's storeroom.
- D. Medical ward.
- E. Crew space (S.B. attendants' room.)
- F. Storeroom for seamen's branch.

Hurricane Deck.

- A. Hatch for hoisting or lowering seriously wounded cases.
- B. Small steam launch.
- C. 7 meter boats.
- D. Water tank.

Upper Deck.

- A. Mortuary.
- B. Infection ward for officers.
- C. Shoot for garbage and waste material.
- D. Sterilizing chamber for dressing materials.
- E. S.B. attendants' office.
- F. Room for preparing for operation.
- G. Operating room.
- H. Pathological and bacteriological laboratory.
- I. Chemical laboratory and room for repairing instruments.
- J. Dispensary.
- K. Spare cabin.
- L. Apothecary's room.
- M. Chief surgeon's room.
- N. Surgeons' rooms.
- O. Paymaster's room.
- P. Officers' mess-room.
- Q. Consulting room for out-patients.
- R. Mess rack for patients.
- S. Paymaster's office.
- T. Storeroom for vegetables.
- U. Sky light of medical ward.
- V. Drying room for clothes.
- W. Laundry.
- X. Steam disinfectant.
- Y. Skylight of medical ward.
- Z. Sailor's room.

Middle Deck.

- A. Officer's sick rooms.
- B. Closets for sick officers.
- C. X-ray room and dark room.
- D. Elevator.
- E. Surgical ward.
- F. Stove.
- G. Dining tables.
- H. Double-banked beds.
- I. Serving table.
- J. Surgeon's office.
- K. Bath room and closet for surgical patients.
- L. Sailor's storeroom.
- M. Spare bath room and lavatory for patients.
- N. Insane cells.
- O. Officers' sick rooms.
- P. Spare sick wards.
- Q. Head ward master's cabin.
- R. Bath and closets for patients.
- S. Ladder for S.B. attendants.
- T. Gangway for receiving patients.
- U. Medical ward.
- V. Dining table.
- W. Double banked beds.
- X. Shoot for garbage and waste material.
- Y. Infection wards.
- Z. Entrance to the spare medical ward in the hold.
- a. Canteen.
- b. Baths and lavatory for medical patients.

Lower Deck.

- A. Food storeroom.
- B. Patients' bag rack.
- C. Storeroom for hospital clothing.
- D. Medical storeroom, shelves.
- E. Medical storeroom.
- F. Storeroom for dressing material, shelves.
- G. Storeroom for drugs, shelves.
- H. Ice making tank.
- I. Ice storeroom.
- J. Cold storage room.
- K. Ice machine.
- L. Double banked beds, for 41 patients.
- M. Crew space (S. B. attendants' room.)
- N. Bag rack.
- O. Spare medical ward.
- P. Double banked beds.
- Q. Stokers' room.

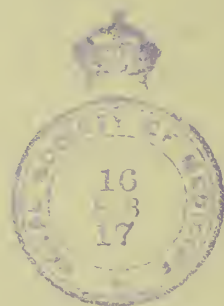
Inboard Profile.

Hurricane Deck.

Upper Deck.

Middle Deck.

Lower Deck.



bationary assistant surgeons, the preparation of statistical returns, pathological examination, physical examination, the disinfection and supervision of the ships, torpedo-boats, clothing, etc., the orderly arrangement of the sickberths placed under his care, the custody of the medical history sheets, and the inspection of the clothing of the sickberth staff under his charge.

A surgeon on the day's duty is responsible for the execution of routine, the disposition of business relating to the outside world, the police supervision on the ship, the keeping of the Daily Sick Book, the rounds in the ship, the supervision of provisions and meals, the examination of out-patients, and the looking after the ship's steamboat arriving and departing. The apothecary is responsible for the sanitary examination, the preparation and supply of medical stores, the supervision of dispensing medicines, the superintendence of the instrument repairers at work, the orderly arrangement of the dispensary, X-ray room, chemical laboratory, photographic studio, instrument-repairing room, the medical store-room and the inspection of the clothing belonging to his subordinates.

The duties for which the chief paymaster is responsible are the drafting of various papers not connected with medical matters, the supervision of postal and telegraphic business, the superintendence of the writers, stewards, cook's mate, hired cooks etc. at work, taking charge of the valuables belonging to patients, the overseeing of the canteen, the examination of the clothing of his sub-ordinates, and the entry of the receipt of presents in a book provided for the purpose.

The medical staff on the *Saikio Maru*, is as follows :—

Surgeon in Command.....	Surgeon Inspector or Fleet Surgeon	1.
Surgeon Inspector Y. Ota.		
Senior Surgeon.....	Fleet or Staff Surgeon	1.
Staff Surgeon K. Aoki, promoted to Fleet Surgeon on July 13, 1904.		
Surgeons		5.
Apothecaries		2.

Those on the *Kobe Maru*, were as below :—

Surgeon in command.....	Surgeon Inspector or Fleet Surgeon	1.
Surgeon Inspector T. Honda, afterward on May 9th, 1905, replaced by Surgeon Inspector J. Ishikawa.		

Senior Surgeon.....Fleet or Staff Surgeon	1.
Staff Surgeon Y. Negoro, replaced on June 21, 1905, by Staff Surgeon T. Kagami (promoted to Fleet Surgeon on August 5, 1905)	
Surgeons	5.
Apothecaries	2.

SECTION III. MEDICAL ARTICLES PROVIDED.

At the time of equipment, the hospital ships received, from the Kure Naval Hospital, their first supply of medical stores to be used in treating the patients to be admitted on board. These articles were at that time supplied according to the regulations issued in the year 1900. The progress, however, that has been made in medical and surgical arts since that date necessitated the supply of medical articles in a larger variety and in larger quantities than was then contemplated. The provision had therefore to be made in violation of the said regulations. And every time the ships had to call at a Naval Port at home on their visits back from the front, they received fresh supplies in the required varieties and quantities to be stored on board ready for use.

Each of the ships received about the same articles and in about the same quantities. We shall therefore give below the lists of the supplies made to the *Saikio Maru*, for the years 1904 and 1905.

I. MEDICAL ARTICLES SUPPLIED DURING THE PERIOD FROM FEBRUARY 11th, 1904 TO DECEMBER 31st OF THE SAME YEAR.

1. FIXED ARTICLES.

Articles	Quantities Received	Quantities Damaged or Returned
General operating case..... No.	1	One returned.
Operating case, small No.	3	
Ophthalmic instrument case..... No.	1	
Trial case (eye)..... No.	1	
Ophthalmoscope..... No.	1	
Microscope..... No.	2	

Sphygmometer	No.	1	
Vaccination case	No.	1	
Aural instrument case	No.	1	Returned.
Auriscopes	No.	2	
Nasal specula	No.	1	
Laryngeal mirror	No.	1	
Tongue depressor(German silver)...	No.	2	
Laryngeal steam spray.....	No.	3	
Irrigator	No.	8	
Dressing trays	No.	19	
Disinfection basins.....	No.	7	One returned.
Caustic case with holder	No.	3	
Arm and humerus splints, iron ...	No.	6	
Leg and thigh splint	No.	5	
Stomach-pump	No.	1	
Knapp's trachoma forceps roller ...	No.	1	
Intestinal forceps	No.	1	
Murphy's anastomosis buttons	No.	3	
Bone chisel	No.	1	
Tooth forceps case.....	Set	1	
Tooth instrument case	No.	1	
Bone drill.....	Set	2	
Hammer	No.	1	
Bladder syringe	No.	1	
Paquelin's thermocautery	No.	1	
Battery for Faradic current.....	No.	1	
Sterilizer for dressing materials ...	No.	1	
Formaldehyde sterilizer.....	No.	3	
High pressure spray apparatus for disinfection.....	No.	7	Two returned.
Long dressing forceps	No.	4	
Operating table.....	No.	2	

Articles	Quantities Re- ceived	Quantities Damaged or Returned
In-door ambulance..... No.	1	A kind of an operating table. Of which three returned.
Stretchers No.	14	
Nurses' emergency bag..... No.	3	
X-ray-apparatus No.	1	
Aspirators No.	2	
Spencer wells' artery forceps No.	16	
Rectal speculum..... No.	2	
Haemorrhoidal forceps, Jones' No.	1	
Silver catheter case Set	1	
Silver bougies Do.	1	
Dissecting instrument case (large)... No.	1	
Dissecting instrument case (small)... No.	1	
Plaster knives and plaster shears, case No.	1	
Suture needle with handle No.	1	
Bullet extractor No.	2	One returned. One returned.
Hygrometer No.	3	
Balance No.	3	
<i>Momme</i> scale..... No.	1	
Two gramme scale No.	3	
Weighing boat No.	2	
Brass spoon No.	5	
Iron spatula No.	3	
Pill machine No.	1	
Fracture cradle..... No.	20	
Bed-rest No.	6	
Waist- supports..... No.	1	
Brass basin No.	30	
Sterilizer for instruments No.	2	
Enamelled pan No.	3	

Copper pan	No.	1	
Bandage winder	No.	1	
Esmarch's bandage	No.	4	Two Returned.
Chloroform inhaler	No.	2	
Glass bobbin.....	No.	2	One returned.
Hypodermic syringes.....	No.	26	17 returned.
Antitoxin syringes	No.	4	One returned.
Saline infusion apparatus	No.	1	
Tongue depressors(buffalo's horn)... No.		5	Two returned.
Laryngeal probe	No.	1	
Clinical thermometer.....	No.	59	12 returned and 15 damaged.
Test figures on card board (Snellen)... Set		1	
Glass mortar.....	No.	4	
Glass pestle	No.	4	
Earthenware mortar.....	No.	2	
Earthenware pestle	No.	4	Two damaged.
Portable surgical bag	No.	2	
Chatelaine	No.	18	Three returned.
Water test case.....	No.	1	
Dynamometer	No.	1	
Personal weighing machine.....	No.	1	
Coloured worsteds, Holmgren's series set.		1	
Tape measure	No.	5	Two returned.
Enema syringes, rubber.....	No.	10	Three returned.
Rubber syringes	No.	10	
Small rubber syringes	No.	20	
Oesophageal tube, rubber.....	No.	1	
Urethral bougies, rubber	No.	12	
Rubber catheter	No.	42	
Ice-caps, rubber	No.	2	
Circular air-cushions.....	No.	9	
Jars for medicine for external application	No.	11	Two damaged.

Articles	Quantities Received	Quantities Damaged or Returned
Splints for the upper extremities... No.	20	
Splints for the lower extremities..... No.	20	
Pill tiles No.	2	
Can-opener No.	1	
Cork screw No.	3	
Pill coater No.	1	
Cork presser..... No.	1	
Shears for miscellaneous use..... No.	8	
Funnel stand No.	3	One returned.
Brass pitcher No.	2	
Liston's long splints..... No.	16	Two returned.
Wooden back leg splints..... No.	5	
Angular arm splints..... No.	10	
Crutches No.	20	Six returned.
Commode No.	10	
Thermometer..... No.	3	
Mackintosh sheets Sheet	3	
Spray No.	1	
Rubber pillows..... No.	6	
Operating gown No.	72	Nine returned.
Isolation gown* No.	15	Three returned.
Jars No.	11	
Spoon (buffalo's horn) No.	5	
Bottles for shelves..... No.	150	
Ointment jars No.	39	Four damaged.
Instrument table, with glass plate. No.	1	
Lipped bowl..... No.	3	
Porcelain bowl No.	7	Two Returned.

* White gown resembling an operating gown, for surgeons and attendants, to be worn in infectious ward.

Medicine measure, earthenware..... No.	4	
Spirit lamp No.	2	One returned.
Large glass bottles No.	18	Five damaged.
Aseptic wash-stands No.	6	

Fixed Articles not Embraced in the Supply-tables.

Articles	Quantities Received	Quantities damaged or returned
Water test case..... No.	3	One returned.
Razor strap No.	1	Returned.
Filter No.	1	
Brass spittoons No.	78	
Watering pots No.	4	
Receptacle for soiled dressings, etc. No.	7	
Ear, nose and throat case..... No.	1	
Forceps with catch No.	2	
Raspatory No.	1	
Lumbar puncture trocar No.	1	
Chain saw..... No.	1	
Hæmorrhoidal forceps No.	1	
Sharp hook No.	4	
Blunt hook No.	2	
Ophthalmic galvano-cautery No.	1	
Bladder trocar No.	1	
Ear trays No.	2	
Dressing forceps No.	5	One returned.
Infusion pan..... No.	3	One returned.
Canvas chair..... No.	13	One returned.
Michels' forceps..... No.	1	
Bandage and dressing box No.	17	Two damaged.
Acetylene lamps No.	9	Five returned.
Finger guards No.	2	

Articles	Quantities Received	Quantities damaged or Returned
Instrument table No.	2	
Balance No.	1	
Shears for cutting splints..... No.	1	
Scissors No.	6	
Iodoform glycerine syringe No.	1	
Needle holders No.	3	
Urethral caustic injector No.	1	
Urethral syringe No.	2	
Goggles No.	6	
Instrument stand, metal No.	1	
Veils for pest No.	3	
Operation-gloves No.	3	
Hip-bath No.	3	One returned.
Wash basin enamelled No.	5	
Razors No.	3	One returned.
Mackintosh sheets Sheet	4	One returned.
Volkmann's rib shears No.	1	
Skin grafting knife No.	1	
Drop bottles, case..... No.	1	
Ophthalmic steam spray No.	1	
Wire twister..... No.	1	
Suture adjuster..... No.	1	
Aesthesiometer No.	1	
Microscopic accessories case No.	1	
Physical examination box..... No.	1	
Volkmann's tin splints..... No.	8	
Operation stool..... No.	1	

2. CONSUMABLE ARTICLES.

Articles	Quantities Consumed
Medicine tumblers..... No.	84
Glass funnels..... No.	2
Tin funnels..... No.	5
10 grammes glass measures..... No.	4
200 grammes glass measures..... No.	6
500 grammes glass measures..... No.	2
Glass spittoons..... No.	43
Sponges, surgical..... No.	7
Double eye shades..... No.	9
Flexible wooden splints (large)..... No.	57
Flexible wooden splints (medium)..... No.	62
Flexible wooden splints (small)..... No.	57
Felt..... <i>Shaku</i>	117
Soap..... No.	232
Gutta-percha..... Square <i>shaku</i>	2
Pads for iron splints..... No.	14
Cotton cloths..... <i>Tan</i>	951
Lint..... No.	46
Cotton wools..... <i>Momme</i>	66,700
Absorbent cotton wools..... Do.	27,600
Absorbent gauze..... <i>Tan</i>	1,555
First aid packages..... No.	10
Paraffin paper..... Sheet	1,650
White flannel..... <i>Shaku</i>	90
Bleached calico..... No.	190
Triangular bandages..... Sheet	260
Silk ligatures..... <i>Momme</i>	30
Nail brushes..... No.	55
White cotton threads..... <i>Momme</i>	105

Articles	Quantities Consumed
Silver wire..... <i>Momme</i>	5
Catgut No.	5
Pins No.	2,300
Chamois leather..... Sheet	8
Ice-caps..... No.	544
Mackintosh sheet Sheet	12
Oiled paper Do.	1,298
Rubber tubes <i>Shaku</i>	131
Feeding rubber tubes..... No.	124
Feeding cups, earthenware No.	7
Medicine cups No.	137
Suspender No.	4
Towels Sheet	32
Glass urinals..... No.	67
Earthen bed-pans..... No.	43
Brushes for applying medicine externally No.	220
Lead grains..... <i>Momme</i>	200
Square paper for powder..... Sheet	19,500
Paper sacks for medicine..... No.	1,750
Medicine bottles No.	467
Corks No.	1,420
Boxes of chip-wood No.	460
Filter paper Sheet	145
Medicine cards Do.	350
Cards for medicine bottles..... Do.	3,650
Cotton string for medicine bottles..... <i>Momme</i>	140
Ice <i>Kin*</i>	5,200

* *Kin*=a pound.

Article not Embraced in the Supply-tables.

Articles	Quantities Consumed
Glass syringes No.	110
Glass bottles..... No.	110
Drop tubes No.	25
Aseptic water-proof cloths <i>Shaku</i>	21
Test tubes..... No.	100
Wound clamps No.	20
Aluminium splints No.	36
Graduated pipette, 5 c.c. No.	1

3. DRUGS.

Articles	Quantities Consumed
Acidum aceticum Gramm	262
Acidum arsenicosum Do.	10
Acidum boricum Do.	5,400
Acidum carbolicum Do.	26,000
Acidum hydrochloricum Do.	5,750
Acidum nitricum Do.	56
Acidum picricum Do.	198
Calcii chloridum Do.	1,250
Calcii sulphas (plaster of Paris) Do.	26,500
Camphora Do.	687
Cera flava..... Do.	200
Cerii oxalas Do.	14
Quininae hydrochloridum Do.	280
Chloral hydras Do.	173
Chloroformum Do.	3,800
Cocainae hydrochloridum Do.	49
Caffeina..... Do.	72
Collodium Do.	3,037

Articles	Quantities Consumed
Cortex cinchonæ .....Gramme	19,300
Cupri sulphas Do.	48
Acidum salicylicum Do.	338
Acidum sulphuricum..... Do.	450
Acidum sulphuricum crudum Do.	1,100
Acidum tannicum..... Do.	308
Acidum tartaricum Do.	650
Adeps Do.	50
Ether Do.	13,300
Dermatol Do.	575
Gum plaster <i>Shaku</i>	180
Emplastrum plumbi .....Gramme	625
Extractum filicis Do.	46
Extractum gentianae Do.	275
Extractum hyoseyami Do.	91
Extractum glycyrrhizae Do.	500
Extractum belladonnae..... Do.	168
Extractum ergotae Do.	168
Extractum nucis vomicae..... Do.	28
Extractum taraxaci Do.	450
Ferri sulphas Do.	8
Digitalis folia Do.	43
Alumen..... Do.	1,750
Ammonii carbonas Do.	675
Amylum Do.	1,350
Wheat flour Do.	23,500
Phenazonum Do.	829
Liquor ammoniae Do.	450
Aqua Laurocerasi..... Do.	1,650
Uvae ursi folia..... Do.	50

Glycerinum	Gramme	11,700
Acaciae gummi.....	Do.	20
Hydrargyri perchloridum	Do.	2,850
Hydrargyri subchloridum.....	Do.	667
Hydrargyri oxidum rubrum.....	Do.	4
Hydrargyri salicylas	Do.	94
Ichthyol	Do.	761
Iodoformum	Do.	950
Potassa caustica	Do.	2,478
Potassii acetat	Do.	1,688
Potassii bichromas.....	Do.	150
Potassii bitartras	Do.	4,400
Argenti nitras, crystal.....	Do.	130
Argentum nitricum cum kalio nitrico	Do.	36
Atropinae sulphas.....	Do.	2
Copaiba.....	Do.	350
Balsamum peruvianum.....	Do.	480
Petroleum benzin	Do.	800
Bismuthi subnitras	Do.	5,240
Potassii bromidum	Do.	2,600
Potassii chloras.....	Do.	14,250
Potassii iodidum	Do.	3,600
Potassii nitras	Do.	525
Potassii permanganas	Do.	50
Creosotum	Do.	278
Creosoti carbonas	Do.	1,288
Liquor ammonii acetatis	Do.	450
Liquor ferri perchloridi	Do.	345
Liquor potassae arsenitis	Do.	284
Lycopodium	Do.	450
Magnessii sulphas.....	Do.	20,350
Morphinae hydrochloridum	Do.	25

Articles	Quantities Consumed
Sodii bicarbonas Gramme	10,800
Sodii bromidum Do.	900
Sodii chloridum..... Do.	4,950
Sodii salicylas Do.	3,750
Soda caustica Do.	1,200
Theobromatis oleum Do.	575
Morrhuae oleum Do.	4,750
Menthae piperitae oleum Do.	292
Ricini oleum..... Do.	4,950
Oleum sesami Do.	8,000
Terebinthinae oleum..... Do.	450
Opium Do.	83
Pepsinum saccharatum Do.	1,257
Anti-sera Bottle	20
Sero-diagnostic fluid for typhoid fever..... Do.	10
Physostigminae salicylas..... Gramme	1
Pilocarpinae hydrochloridum..... Do.	1
Plumbi acetas Do.	1,825
Pulvis ipecacuanhae compositus Do.	490
Ipecacuanhae radix Do.	106
Pulvis glycyrrhizae Do.	1,702
Senegae radix Do.	1,200
Saccharum purificatum Do.	48,500
Saccharum lactis Do.	1,275
Salol Do.	1,262
Santoninum Do.	24
Sapo durus Do.	20
Sinapis pulvis ... Do.	850
Stomachic tabloid No.	450
Syrupus ferri iodidi Gramme	250

Alcohol	Gramme	163,300
Spiritus vini gallici	Do.	60,650
Spiritus aetheris nitrosi.....	Do.	450
Spiritus camphorae	Do.	2,800
Spiritus ammoniæ aromaticus	Do.	450
Sulphonal	Do.	225
Thymol.....	Do.	158
Tinctura amara.....	Do.	11,700
Tinctura digitalis	Do.	225
Tinctura iodi.....	Do.	1,725
Tinctura ipeacuanhæ	Do.	875
Tinctura opii	Do.	450
Antipyrine tabloid	No.	100
Tinctura opii benzoica	Gramme	1,050
Tinctura belladonnæ	Do.	12
Tinctura strophanthi.....	Do.	1,662
Tinctura nucis vomicae.....	Do.	678
Tinctura zingiberis	Do.	50
Unguentum hydrargyri.....	Do.	1,575
Unguentum vesicans.....	Do.	225
Vaseline	Do.	9,450
Zinci chloridum.....	Do.	128
Zinci oxidum	Do.	550
Zinci sulphas	Do.	226
Gelatine capsule	No.	600
Vaccine lymph.....	Set.	67
Dover's powder tabloid	No.	40

Drugs not Embraced in the Supply-tables.

Articles	Quantities Consumed
Hydrargyri oxidum flavum	Gramme 28
Olivæ oleum.....	Do. 10,338

Articles	Quantities Consumed
Fuchsin Gramme	8
Adrenalin chloride solution Do.	175
Itrol Do.	18
Eucain B hydrochloride..... Do.	167
Cera alba Do.	150
Sal carolinum factitium..... Do.	4,950
Resoreinum Do.	60
Sodii salicylas tabloid No.	60
Formalin Gramme	2,050
Phenacetinum Do.	20
Bismuthi subsalicylas Do.	168
Tannigen Do.	275
Aqua distillata Do.	211,900
Wine..... Do.	3,900
Calcii carbonas praecepitatus..... Do.	7,650
Acaciae gummi..... Do.	900
Lysol Do.	350
Airol..... Do.	56
Guaiacol carbonate Do.	754
Homatropinae hydrochloridum Do.	2
Protargol Do.	50
Acidum stearicum..... Do.	84
Bird-lime Do.	900
Xeroform Do.	20
Cassiae oleum..... Do.	28
Pix liquida Do.	450
Soda caustica..... Do.	450
Asakawa's Sero-diagnostic fluid for typhoid fever Do.	200
Liquor hydrogenii peroxidi Do.	480

Chemicals, colours and other fixed consumable articles for chemical and bacteriological examinations, were supplied to both ships in the variety and quantities prescribed. However, there often arose needs for the ships to be supplied with articles and quantities besides those stated in the Medical Supply Regulations relating to the Hospital. The total amount of the articles supplied in this way was as follows:—

Received From	Fixed Articles	Consumable Articles	Chemicals and Colours
Medical Dépôt of Kure Naval Hospital	58 items	59 items	77 items
Medical Dépôt of Sasebo Naval Hospital	24 „	68 „	72 „
Medical Dépôt of Maidzuru Naval Hospital	3 „	10 „	9 „
Total	85 „	137 „	158 „

N. B. There were two items among those mentioned above which were returned as unfit for use.

The quantities of the articles for chemical and bacteriological tests to be stored regularly on a hospital ship which were received by the ships under consideration, the quantities of the consumable materials, and drugs which were received and actually consumed, are shown in details in the following tables.

1. FIXED ARTICLES.

Articles	Quantities Received	Quantities Damaged or Returned
Mohr's scale	No. 1	
Cork presser	No. 1	
Pinch-cocks	No. 7	
Balance	No. 1	
Micrometer	No. 1	
Platinum crucible	No. 1	
Microtome	No. 1	

Articles	Quantities Received	Quantities Damaged or Returned
Platinum plate No.	1	One returned
Wolffhügel's apparatus..... No.	1	
Bezelius' lamp..... No.	1	
Drying apparatus..... No.	1	
Water-bath No.	2	
Incubating oven No.	1	
Sterilizer No.	1	
Condenser No.	3	
Sulphuric acid drying apparatus ... No.	2	
Kipp's gas-generator..... No.	1	
Glass bell No.	1	
Spirit lamps..... No.	8	
Spatula (buffalo's horn) No.	2	
Glass mortar..... No.	1	
Glass pestle No.	1	
Cork borer No.	1	Three returned
Scissors for miscellaneous uses No.	1	
Blowpipe No.	1	
Trivets No.	7	
Forceps (dissecting) No.	7	
Cornet forceps No.	3	
Files No.	3	
Test tube stands No.	3	
Funnel stand..... No.	1	
Pipette stand No.	1	
Burette stand No.	2	
Earthen mortar..... No.	1	
Earthen pestle No.	1	
Camera No.	3	
Plate racks No.	4	

Dark room lamp	No.	1	
Printing frames	No.	9	
Vats	No.	16	
Hydrometer	No.	1	
Marchand's lactocrit	No.	1	
Needles in handles	No.	3	
Bottles for reagents	No.	155	
Drop bottles with grooved stopper.	No.	7	
Graduated flasks	No.	5	
Burettes	No.	3	
Glass cylinders	No.	4	
Graduated cylinders with stoppers	No.	5	
Separating funnels.....	No.	2	
Centigrade thermometers	No.	7	One returned.
Centrifugal machine	No.	1	
Glass jars for mice	No.	3	
Cage of iron-wire	No.	1	
Receptacles for culture media	No.	4	
Test glasses	No.	3	

Articles not Embraced in the Supply-table.

Articles	Quantities Consumed
Big glass bottles	No. 5
Dissecting instruments case for animals	No. 1
Mouse-holder.....	No. 1
Haemoglobinometer	No. 1
Photograph albums.....	Copy 4

2. CONSUMABLE ARTICLES FOR TESTS.

Articles	Quantities Consumed
Flasks	No. 48
Watch glasses	No. 7

Articles	Quantities Consumed
Glass evaporating basins No.	9
Earthen evaporating basins No.	4
Conical test glasses No.	3
Test-tubes No.	440
Beakers..... No.	61
Glass tubes Grammes	2,665
Platinum wire <i>Shaku</i>	2.4
Copper wire netting Do.	10
Copper wire Do.	50
Distilling flasks..... No.	3
Iron triangle..... No.	1
Asbestos plate..... Sheet	3
Glass wool..... Gramme	140
Glass rods..... No.	60
Object slides No.	400
Cover glasses No.	640
Object slides with hollow centre No.	5
Petri's plates..... No.	40
Rubber tubes <i>Shaku</i>	40
Rubber caps..... No.	24
Glass funnels..... No.	10
Rubber stoppers No.	7
Litmus paper Bundle	66
Corks..... No.	80
Sealing-wax <i>Momme</i>	350
Glazed paper Sheet	1
Filter paper Do.	195
Mice No.	2
Test-tube brushes No.	22
Round wicks of lamps Bundle	8

Pipettes	No.	23
Matches	Box.	290
Paraffin	Gramme	350
Negatives	No.	246
Silvered papers	Sheet	135
Paste-boards	Do.	217
Varnish	Momme	10
Beef	Kin	15
Petroleum	Go	350

Articles not on the List.

Blood serum medium(in test tubes)	No.	50
Gelatin medium(in test tubes)	No.	100
Agar-agar medium(in test tubes)	No.	200

3. CHEMICALS, REAGENTS AND COLOURS.

Articles	Quantities Consumed
Acidum aceticum glaciale	Gramme 112
Acidum hydrochloricum	Do. 3,250
Ammonium molybdate	Do. 5
Ammonium oxalate	Do. 72
Petroleum benzin	Do. 825
Brucine	Do. 5
Corrosive sublimate	Do. 92
Hydrochinone	Do. 186
Nitric acid	Do. 1,550
Acidum oxalicum	Do. 36
Pyrogallie acid	Do. 114
Rosolic acid	Do. 3
Sulphuric acid	Do. 3,937
Crude sulphuric acid	Do. 2,500

Articles	Quantities Consumed
Tannic acid Gramme	36
Ether..... Do.	4,100
Ammonium carbonate Do.	230
Ammonium chloride..... Do.	230
Lacmus Do.	56
Sodium bicarbonate Do.	25
Sodium carbonate Do.	1,800
Sodium chlorate Do.	380
Sodium nitrite Do.	50
Sodium phosphate..... Do.	120
Sodium sulphite Do.	1,125
Sodium hyposulphite..... Do.	16,650
Ammonium sulphide..... Do.	150
Ammonium thiocyanate Do.	232
Ammonium sulphate..... Do.	100
Starch Do.	185
Amidol Do.	18
Liquor ammoniac Do.	1,925
Silver nitrate, crystal Do.	41
Auri chloridum..... Do.	40
Caustic baryta Do.	112
Barium chloride Do.	82
Sodium potassium tartrate Do.	84
Caustic soda Do.	112
Phenol-phthalein Do.	23
Phloroglucin Do.	8
Alcohol Do.	76,900
Absolute alcohol Do.	3,050
Vanillin..... Do.	3
Calcium chloride Do.	500

Chlorinated lime	Gramme.	900
Chloroform	Do.	500
Copper sulphate	Do.	32
Grape sugar	Do.	145
Diphenyl-amin	Do.	13
Ferrous sulphide	Do.	2,600
Ferrous sulphate	Do.	125
Glycerin	Do.	450
Mercury	Do.	7,050
Xylol.....	Do.	56
Oil of cloves.....	Do.	8
Cedar oil	Do.	28
Canada balsam.....	Do.	25
Celloidin	Do.	13
Agar-agar	Do.	300
Gelatin	Do.	100
Eikonogen.....	Do.	18
Iodine	Do.	18
Caustic potash	Do.	1,750
Potassium carbonate	Do.	450
Potassium bichromate	Do.	16
Potassium chlorate	Do.	36
Potassium ferricyanide	Do.	10
Potassium ferrocyanide	Do.	18
Potassium nitrite	Do.	16
Potassium permanganate	Do.	50
Peptone.....	Do.	100
Congo red	Do.	8
Fuchsin.....	Do.	61
Methylene blue	Do.	98
Genian violet	Do.	14

Articles	Quantities Consumed
Eosin Gramme.	6
Hæmatoxylin Do.	4

Those not Embraced in the Table

Citric acid..... Gramme	170
Acetic acid Do.	600
Aniline Do.	9
Methyl blue Do.	14
Brucine sulphate Do.	13
Distilled water Do.	32,550
Sulpho-salicylic acid Do.	51
Pure zinc Do.	50

II. MEDICAL ARTICLES SUPPLIED DURING THE PERIOD FROM
JANUARY 1st, TO NOVEMBER 24th 1905.

The medical articles with complements received from every Naval Medical Depôt by the *Saikio Maru* were as follows:—

Received From	Fixed Articles	Consumable Articles	Drugs
Medical Depôt of Yokosuka Naval Hospital	6 items	18 items	24 items
Medical Depôt of Kure Naval Hospital	11 „	4 „	8 „
Medical Depôt of Sasebo Naval Hospital	9 „	35 „	69 „
Medical Depôt of Maizuru Naval Hospital	6 „	3 „	11 „
Complements for the <i>Saikio Maru</i>	7 „	4 „	5 „
Total	39 „	64 „	117 „

Articles damaged or restored to the Medical Depôts were as follows:—

Articles	Quantities Damaged	Quantities Returned
Fixed articles	29 items	225 items
Consumable articles	—	55 „
Drugs	—	169 „

N.B. By articles restored we mean those which were unfit for use, or which became useless on account of the Hospital Ship being released from service.

The quantities of articles damaged or restored to Medical Depôts are given in details in the tables below:—

1. FIXED ARTICLES.

Articles	Quantities Damaged	Quantities Restored
General operating case No. 1..... No.	—	1
Operating case..... No.	—	2
Tooth forceps case Set.	—	1
Tooth instrument case No.	—	1
Ophthalmic instrument case No.	—	1
Trial case (eye) No.	—	1
Ophthalmoscope No.	—	1
Bone drills Set.	—	2
Hammer No.	—	1
Bladder syringe No.	—	1
Paquelin's thermocautery No.	—	2
Battery for Faradic current No.	—	1
X-ray apparatus No.	—	1
Röntgen ray tube No.	—	1
Aspirators No.	—	2
Spencer Wells' artery forceps No.	—	14
Rectal speculas No.	—	2
Hæmorrhoidal forceps, Jones'..... No.	—	2

Articles	Quantities Damaged	Quantities Restored
Microscopes No.	—	2
Hæmacytometer No.	—	1
Hæmoglobinometer No.	—	1
Sphygmometer..... No.	—	1
Vaccination case No.	—	1
Auriscopes No.	—	1
Nasal speculum No.	—	1
Dissecting instrument case (large) No.	—	2
Dissecting instrument case (small) No.	—	1
Plaster knife and plaster shears case No.	—	1
Suture needle with handle No.	—	1
Bullet extractors..... No.	—	2
Tongue depressors (German silver) No.	—	2
Laryngeal steam sprays No.	—	4
Irrigators No.	—	9
Dressing trays..... No.	—	22
Instrument trays..... No.	—	6
Caustic case with holder..... No.	—	3
Laryngeal mirror No.	—	1
Stomach pump No.	—	1
Knapp's trachoma forceps, roller No.	—	1
Intestinal forceps..... No.	—	1
Murphy's anastomosis buttons No.	—	3
Chain saw No.	—	1
Bone chisel No.	—	1
Fracture cradles No.	—	22
Bed-rest No.	—	6
Loin support No.	—	1
Brass basins No.	—	30
Sterilizer for instruments..... No.	—	2

Sterilizer for dressing materials.....	No.	—	3
Formaldehyde sterilizer	No.	—	3
High pressure spray apparatus	No.	—	6
Long dressing forceps.....	No.	—	4
Operating table	No.	—	2
Indoor ambulance	No.	—	1
Silver catheter case.....	Set	—	1
Silver bougies.....	Do.	—	1
Portable surgical bag.....	No.	—	2
Chatelaine	No.	—	19
Water test case	No.	—	1
Dynamometer	No.	—	1
Personal weighing machine.....	No.	—	1
Hygrometers	No.	—	2
Balance	No.	—	2
Momme scale	No.	—	2
Two gramme scale	No.	—	3
Weighing boat	No.	—	2
Brass spoons	No.	—	5
Iron spatula	No.	—	5
Pill machine	No.	—	1
Rubber catheter	No.	2	40
Rubber ice caps.....	No.	—	3
Circular air-cushions, rubber	No.	—	9
Spray	No.	—	1
Jars for medicines for external application.....	No.	2	7
Splints for the upper extremities	No.	—	20
Iron splints for the upper extremities	No.	—	6
Arm and humerus splints, iron	No.	—	5
Pill coater	No.	—	1
Cork pressor	No.	—	1
Shears for miscellaneous use	No.	—	7

Articles	Quantities Damaged	Quantities Restored
Funnel-stands No.	—	2
Brass pitchers..... No.	—	2
Enamelled pans..... No.	—	3
Copper pans No.	—	2
Bandage winder..... No.	—	1
Esmarch's bandages No.	—	2
Chloroform inhalers No.	—	2
Glass bobbin No.	—	1
Hypodermic syringes No.	—	19
Antitoxin syringes No.	—	2
Mackintosh sheets..... Sheet	—	4
Rubber pillows No.	—	6
Operating gown No.	—	63
Isolation gown* No.	—	12
Solution jars No.	1	11
Spoons (buffalo's horn) No.	—	5
Stretchers No.	—	11
Nurses' emergency bag No.	—	3
Saline infusion apparatus No.	—	1
Tongue depressor (buffalo's horn) No.	—	6
Laryngeal probe..... No.	—	1
Clinical thermometers..... No.	15	45
Test figures on card board (Snellen)..... Set	—	1
Colored worsteds, Holmgren's Series..... Do.	—	1
Tape measures No.	—	4
Enema syringes, rubber..... No.	—	7
Rubber syringes..... No.	—	10
Rubber syringes, small No.	—	19
Æsophageal tube, rubber No.	—	1

*White gown resembling an operating gown, to be worn in infectious ward.

Urethral bougies, rubber	No.	—	12
Rubber water-pillows	No.	—	2
Can-opener	No.	—	1
Cork-screws	No.	—	3
Medicine measures, earthenware.....	No.	2	2
Alcohol lamp	No.	1	—
Large glass bottles.....	No.	6	7
Bottles for shelves.....	No.	—	150
Splints for lower extremities	No.	—	20
Liston's long splints	No.	—	14
Wooden back leg splints	No.	—	5
Angular arm splints	No.	—	10
Crutches	No.	—	14
Commodes	No.	—	10
Thermometers	No.	—	3
Glass motars	No.	2	2
Glass pestles	No.	—	4
Earthen mortars.....	No.	—	2
Earthen pestles	No.	—	2
Lipped bowls	No.	—	3
Porcelain bowls	No.	—	6
Pill tiles.....	No.	—	3
Ointment jars, porcelain.....	No.	5	33
Instrument table.....	No.	—	1
Wash-stands	No.	—	6
Shears for cutting tin	No.	—	1

Articles not Specified in the Regulations.

Articles	Quantities Received	Quantities Damaged
Urine test case .. .		

Articles	Quantities Received	Quantities Damaged
Receptacle for soiled dressings, etc..... No.	—	13
Infusion pans No.	—	2
Michel's forceps No.	—	1
Acetylene lamps..... No.	—	4
Operating gloves, rubber..... No.	—	3
Filter No.	—	1
Watering pot..... No.	—	1
Dressing forceps No.	—	6
Canvas chairs..... No.	—	12
Bandage and dressing box..... No.	1	15
Veils No.	—	3
Hip-bathes No.	—	2
Wash basins, enamelled No.	—	5
Mackintosh sheets Sheet	—	3
Forceps with catch No.	—	2
Lumbar puncture trocar..... No.	—	1
Blunt hooks No.	—	2
Bladder trocar No.	—	1
Finger guards No.	—	2
Instrument tables No.	—	2
Scissors No.	—	6
Needle holders No.	—	3
Urethral syringes. No.	—	2
Metal rack for knives No.	—	1
Skin grafting knife No.	—	1
Ophthalmic steam spray No.	—	1
Suture adjuster No.	—	1
Razors..... No.	—	3
Ear, nose, and throat case..... No.	—	1
Raspatory No.	—	1

Sharp hooks.....No.	—	4
Ophthalmic galvano-cautery.....No.	—	1
Ear trays.....No.	—	2
Spectacles .....No.	—	3
Shears for splints.....No.	—	1
Iodoform-glycerin syringe.....No.	—	1
Urethral fluid caustic injector .....No.	—	1
Goggles for plague.....No.	—	3
Volkman's rib shears .....No.	—	1
Drop bottle case.....No.	—	1
Wire twister.....No.	—	1
Aesthesiometer .....No.	—	1
Microscopic accessories .....No.	—	1
Volkman's tin splints.....No.	—	8
Balance.....No.	—	1
Physical examination instruments (bag).....No.	—	1
Operation stool.....No.	—	1
Schleich's syringe .....No.	—	1

2. CONSUMABLE ARTICLES.

Articles	Quantities Consumed	Quantities Returned
Medicine tumblers.....No.	41	19
Tin funnels .....No.	2	3
100 grammes glass measures.....No.	2	1
500 grammes glass measures.....No.	1	2
Sponges, surgical .....No.	4	9
Flexible wooden splints (large).....No.	—	140
Flexible wooden splints (medium).....No.	—	135
Flexible wooden splints (small).....No.	—	140
Gutta-percha..... Square <i>shaku</i>	—	4
Pads for wooden splints.....No.	—	20

Articles	Quantities Consumed	Quantities Returned
Lint..... <i>Tan</i>	25	9
Cotton-wools..... <i>Momme</i>	34,000	2,000
Absorbent gauze..... <i>Tan</i>	845	—
Single eye shade..... <i>No.</i>	3	7
Felt..... <i>Shaku</i>	—	50
Pads for iron splints..... <i>No.</i>	—	26
Cotton cloths..... <i>Tan.</i>	449	—
Oil-paper..... <i>Sheet</i>	445	85
Rubber feeding tubes..... <i>No.</i>	46	40
Medicine cups..... <i>No.</i>	30	43
Glass urinals..... <i>No.</i>	12	26
Brushes for applying medicine externally..... <i>No.</i>	80	100
Square paper for powder..... <i>Sheet</i>	13,800	20,200
Medicine bottles..... <i>No.</i>	75	278
Glass funnel..... <i>No.</i>	4	13
10 grammes glass measures..... <i>No.</i>	9	—
200 grammes glass measures..... <i>No.</i>	1	6
Glass spittoons..... <i>No.</i>	5	32
Double eye shades..... <i>No.</i>	—	11
Hare-lip pins..... <i>No.</i>	5	—
Ice-caps..... <i>No.</i>	816	411
Rubber tubes..... <i>Shaku</i>	85	27
Feeding cups, earthenware..... <i>No.</i>	1	2
Suspender..... <i>No.</i>	3	20
Earthen bed pans..... <i>No.</i>	2	36
Lead grains..... <i>Momme</i>	—	200
Paraffin paper..... <i>Sheet</i>	1,000	500
Bleached calico..... <i>Shaku</i>	152	50
Silk sutures..... <i>Momme</i>	25	30
Silver sutures..... <i>Do.</i>	—	5

Pins	No.	850	400
Chamois leathers.....	Sheet	9	8
Sandarac varnish	Gramme	112	—
Filter paper	Sheet	195	80
Absorbent cotton wools	<i>Momme</i>	17,950	3,450
First aid packages.....	No.	100	90
White flannel	<i>Shaku</i>	40	80
Triangular bandages	Sheet	135	125
White cotton threads.....	<i>Momme</i>	95	300
Catgut	Do.	—	5
Cards for bottles.....	Sheet	2,850	3,300
Soap	No.	142	84
Paper sacks for medicine	No.	1,100	1,300
Corks	No.	1,300	1,100
Box of chip-wood	No.	270	190
Medicine cards	Sheet	250	100
Cotton string for medicine bottles.....	<i>Momme</i>	225	275
Nail brush.....	No.	40	38
Towels	Sheet	24	33

Consumable Articles not Specified in the Regulations.

Articles	Quantities Consumed	Quantities Returned
Glass syringes .....No.	100	—
Aseptic water-proof cloths..... <i>Shaku</i>	39	—
Aluminium splints.....No.	24	—
Drop tubes .....No.	10	—
Wound clamps.....No.	330	200
Glass bottles.....No.	10	—

3. DRUGS.

Articles	Quantities Consumed	Quantities Returned
Acidum arsenicosum.....Gramme	—	18
Acidum boricum .....Do.	4,950	7,650
Acidum carbolicum .....Do.	169,210	9,000
Acidum tannicum.....Do.	168	420
Acidum tartaricum .....Do.	700	3,600
Adeps .....Do.	400	1,800
Acidum hydrochloricum.....Do.	4,800	9,000
Acidum nitricum .....Do.	50	119
Acidum piericum.....Do.	56	196
Acidum salicylicum .....Do.	392	280
Acidum sulphuricum.....Do.	900	—
Acidum sulphuricum crudum .....Do.	300	8,500
Phenazonum .....Do.	822	1,290
Liquor ammoniac.....Do.	—	450
Aqua laurocerasi .....Do.	6,000	—
Argenti nitras, crystal .....Do.	25	125
Argentum nitricum cum kalio nitrico .....Do.	25	107
Collargol .....Do.	—	150
Aspirine .....Do.	237	400
Copaiba.....Do.	100	—
Ether .....Do.	4,250	10,350
Alumen.....Do.	1,850	4,500
Ammonii carbonas.....Do.	—	450
Ammonii chloridum .....Do.	—	2,250
Amylum .....Do.	450	18,000
Wheat flour.....Do.	28,000	—
Bismuthi subnitras.....Do.	1,731	3,369
Calcii chloridum .....Do.	3,250	—

Calcii oxidum	Gramme	—	90,000
Calcii sulphas	Do.	3,150	19,850
Camphora	Do.	546	560
Coffeina	Do.	—	178
Ferri sulphas	Do.	70	400
Digitalis folia	Do.	—	860
Uvae ursii folia	Do.	2,330	4,820
Formalin	Do.	1,100	3,600
Glycerinum	Do.	12,600	5,850
Potassii bichromas	Do.	300	—
Potassii bicarbonas	Do.	—	2,250
Cantharis	Do.	56	56
Cera flava	Do.	—	700
Cerii oxalas	Do.	56	—
Quininae hydrochloridum	Do.	196	924
Balsamum peruvianum	Do.	1,016	—
Petroleum benzin	Do.	1,900	1,350
Cocainae hydrochloridum	Do.	26	57
Colloidium	Do.	2,250	1,125
Cortex cinchonae	Do.	21,200	9,900
Cupri sulphas	Do.	130	300
Dermatol	Do.	550	1,800
Gum plaster	<i>Shaku</i>	66	126
Emplastrum plumbi	Gramme	500	900
Ichthyol	Do.	670	1,630
Iodoformum	Do.	400	900
Potassa caustica	Do.	250	6,300
Potassii acetat	Do.	450	4,500
Liquor ferri perchloridi	Do.	150	225
Liquor potassae arsenitis	Do.	100	400
Lycopodium	Do.	—	450
Magnesii carbonas	Do.	225	—

Articles	Quantities Consumed	Quantities Returned
Extractum filicis .....Gramme	—	122
Extractum gentianae.....Do.	—	1,300
Extractum hyoseyami .....Do.	30	422
Extractum glycyrrhizae .....Do.	—	400
Guaiacol carbonate .....Do.	566	924
Acaciae gummi... .....Do.	—	430
Chloral hydras.....Do.	84	466
Chloroformum .....Do.	1,762	3,438
Extractum belladonnae.....Do.	56	897
Extractum ergotae .....Do.	56	281
Extractum nucis vomicae.....Do.	—	224
Extractum taraxaci .....Do.	—	1,350
Ferrum redactum.....Do.	64	300
Potassii iodidum .....Do.	3,150	8,100
Potassii nitras .....Do.	—	600
Potassii permanganas .....Do.	—	400
Creosotum .....Do.	200	476
Creosoti carbonas .....Do.	28	756
Liquor adreninae hydrochloricus .....Do.	160	347
Liquor ammonii acetatis .....Do.	—	900
Theobromatis oleum .....Do.	550	2,250
Hydrargyri perchloridum.....Do.	1,722	360
Calomel.....Do.	458	1,120
Hydrargyri oxidum rubrum.....Do.	—	24
Hydrargyri salicylas.....Do.	46	504
Hydrargyri sulphas .....Do.	—	450
Sodii bicarbonas .....Do.	9,450	11,250
Sodii bromidum .....Do.	562	3,938
Sodii chloridum.....Do.	2,250	4,500
Sodii salicylas .....Do.	2,550	13,050

Soda caustica	Gramme	150	3,150
Pilula rhei composita	Do.	28	84
Plumbi acetis	Do.	1,100	4,500
Pulvis ipecacuanhae compositus	Do.	—	3,100
Radix ipecacuanhae	Do.	400	—
Pulvis glycyrrhizae	Do.	82	1,951
Radix senegae	Do.	3,300	2,250
Jalapa	Do.	28	90
Saccharum purificatum	Do.	45,750	35,000
Tinctura iodi	Do.	975	2,475
Tinctura ipecacuanhae	Do.	700	900
Tinctura opii	Do.	336	1,008
Magnesi sulphas	Do.	17,000	16,650
Morphinae hydrochloridum	Do.	33	26
Potassii bitartras	Do.	500	8,520
Potassii bromidum	Do.	1,450	1,350
Potassii chloras	Do.	12,300	26,550
Saccharum lactis	Do.	1,650	1,800
Carlsbad salt	Do.	4,500	6,300
Terebinthinae oleum	Do.	450	450
Opium	Do.	33	60
Pepsinum saccharatum	Do.	600	2,700
Physostigminae salicylas	Do.	—	3
Pilocarpinae hydrochloridum	Do.	3	3
Pilula hydrargyri	Do.	—	225
Santoninum	Do.	18	28
Sapo durus	Do.	2,230	2,700
Pulvis sinapis	Do.	350	1,200
Syrupus ferri iodidi	Do.	—	2,000
Spiritus	Do.	180,000	57,150
Strychninae nitrates	Do.	1	2
Tinctura opii benzoica	Do.	—	900

Articles	Quantities Consumed	Quantities Returned
Tinctura scillae Gramme	—	112
Morrhuae oleum Do.	4,250	3,150
Menthae piperitae oleum Do.	200	450
Ricini oleum Do.	1,350	6,300
Oleum sesami Do.	3,450	11,050
Atropinae sulphas Do.	—	7
Alcohol with methyl-alcohol Do.	1,350	—
Spiritus vini galliei..... Do.	13,450	38,350
Spiritus aetheris nitrosi Do.	—	450
Spiritus ammoniae aromaticus..... Do.	13,500	900
Salol Do.	672	3,566
Styrax praeparatus..... Do.	900	—
Sulphonal Do.	186	94
Sulphur sublimatum Do.	300	1,950
Taka-Diastase Do.	151	225
Thymol Do.	292	418
Tinctura aconiti Do.	150	500
Tinctura amara Do.	9,450	7,650
Tinctura digitalis Do.	—	675
Unguentum hydrargyri Do.	1,600	2,000
Unguentum simplex Do.	225	675
Unguentum vesicans Do.	308	252
Zinci oxidum Do.	350	450
Gelatine capsule No.	1,300	1,000
• Anti-sera Bottle.	10	—
Spiritus camphorae Gramme	2,600	4,509
Tinctura belladonnae Do.	550	450
Tinctura strophanthi Do.	700	—
Tinctura nucis vomicae Do.	780	1,350
Tinctura zingiberis Do.	—	1,300

Vaselinum	Gramme	8,550	9,000
Zinci chloridum	Do.	200	206
Zinci sulphas	Do.	670	450
Vaccine lymph	Set	14	—

Drugs not Specified in the Regulations.

Articles	Quantities Consumed	Quantities Returned
Hydrargyri oxidum flavum Gramme	—	28
Olivae oleum Do.	3,130	4,500
Acaciae gummi Do.	450	2,250
Lysol Do.	52	2,448
Chrysarobinum Do.	56	244
Aristol..... Do.	25	—
Aqua destillata Do.	150,200	64,800
Calcii carbonas Do.	5,850	8,550
Phenacetinum Do.	148	252
Naphthalinum Do.	28	196
Xeroform Do.	—	430
Airol Do.	28	84
Itrol Do.	60	75
Eucain B hydrochloride Do.	—	310
Homatropinae hydrochloridum Do.	—	3
Pix liquida..... Do.	—	4,050
Bismuthi subsalicylas Do.	30	922
Dover's powder, tabloid No.	220	—
Tannigen Gramme	75	550
Sapo mollis..... Do.	7,650	2,700
Diuretin Do.	196	476
Wine Do.	41,600	39,000
Soda caustica Do.	—	450
Protargol..... Do.	700	125
Acidum stearicum Do.	140	336

Articles	Quantities Consumed	Quantities Returned
Resorcinum Gramme	80	280
Liquor hydrogenii peroxidi..... Do.	336	1,008
Zinci sulpho carbolas Do.	28	56
Fuchsin Do.	20	—
Cera alba Do.	300	—
Antipyrin, tabloid No.	170	—
Morphine, tabloid No.	60	—

Articles received from the Medical Depôts for the purpose of chemical and bacteriological examination were as follows :—

Received From	Permanent Articles	Consumable Articles	Colours and Chemicals
Medical Depôt of Yokosuka Naval Hospital	1 item	16 items	14 items
Medical Depôt of Sasebo Naval Hospital	1 „	32 „	17 „
Medical Depôt of Kure Naval Hospital	4 „	10 „	26 „
Medical Depôt of Maizuru Naval Hospital	2 „	8 „	1 „
Complement of the hospital ship...	—	—	1
Total	8	66	59

Of the above articles, the following were damaged or returned to the Medical Depôt.

Articles	Returned	Damaged
Permanent articles	65 items	5 items
Chemical and colours	60 „	—
Consumable articles.....	36 „	—

The details of names and quantities of the articles mentioned above are given in the following table with the quantities consumed, damaged or returned.

1. PERMANENT ARTICLES FOR TESTS.

Articles	Quantities Dama- ged	Quantities Re- turned
Mohr's scale No.	—	1
Micrometer No.	—	1
Cork pressor No.	—	1
Scissors for miscellaneous use No.	—	1
Trivets No.	—	4
Cornet's forceps No.	—	3
Microtome No.	—	1
Wolffhügel's apparatus No.	—	1
Files No.	—	3
Test-tube stands No.	—	3
Pipette stand No.	—	1
Pinch-cocks No.	—	7
Drying apparatus No.	—	1
Incubating oven No.	—	1
Earthen pestle No.	—	1
Extractions-apparatus No.	—	1
Camera No.	—	3
Funnel stand No.	—	1
Balance No.	—	1
Platinum crucible No.	—	1
Platinum plate No.	—	1
Bezelius' lamp No.	—	1
Water bath..... No.	—	2
Sterilizer No.	—	1
Cork borer No.	—	1
Blowpipe No.	—	1
Forceps No.	—	7
Glass mortar No.	—	1

Articles	Quantities Damaged	Quantities Returned
Glass pestle..... No.	—	1
Earthen mortar No.	—	1
Test glass No.	—	4
Sterilized filter No.	—	1
Plate racks No.	—	4
Marchand's lactoerit No.	—	1
Bottles for reagents No.	—	175
Graduated flask No.	2	3
Glass cylinders No.	—	4
Separating funnels No.	—	2
Condensor No.	—	2
Kipp's gas-generator No.	—	1
Spatula No.	—	2
Dark room lamp No.	—	1
Vats No.	1	16
Glass jar for mice No.	—	3
Cages of wire(iron) No.	—	2
Burette stand No.	—	2
Hydrometer No.	—	1
Needle in handles No.	—	3
Drop bottles with grooved stopper No.	—	7
Burette No.	—	4
Graduated cylinders with stoppers..... No.	—	5
Centigrade thermometer No.	1	7
Sulphuric acid drying apparatus No.	—	2
Spirit lamps No.	4	8
Printing frames No.	—	11
Centrifugal machine No.	—	1

Mouse holder	No.	—	1
Receptacles for culture media	No.	—	4

Articles not Specified in the Regulations.

Articles	Quantities Consumed	Quantities Returned
Big glass bottles..... No.	—	5
Photograph album..... Copy	—	4
Dissecting instrument case for animals No.	—	1

2. CONSUMABLE ARTICLES FOR TESTS.

Articles	Quantities Consumed	Quantities Returned
Flasks..... No.	30	30
Glass evaporating basins No.	6	14
Pipettes No.	14	44
Glass funnels No.	10	7
Watch glasses..... No.	—	8
Earthen crucibles No.	1	4
Test tubes No.	750	500
Glass tubes Gramme	420	885
Copper wire <i>Shaku</i>	16	—
Copper wire netting Do.	—	5
Glass wool Gramme	5	80
Object slides No.	300	100
Object slides with hollow centre..... No.	5	10
Rubber tubes <i>Shaku</i>	15	15
Rubber stoppers..... No.	—	3
Sealing-wax <i>Momme</i>	—	100
Filter paper Sheet	105	100
Conical test glass No.	2	2
Distillation flasks No.	—	2
Test tube brushes No.	8	3

Articles	Quantities Consumed	Quantities Returned
Matches No.	510	50
Negatives..... Sheet.	270	60
Paste-board..... Do.	195	25
Beakers No.	43	27
Platinum wire <i>Shaku</i> .	10	5
Iron triangles No.	—	6
Asbestos plate..... Sheet	4	—
Glass rods No.	17	13
Cover glass..... No.	610	300
Petri dishes..... No.	55	44
Rubber rods No.	100	—
Weighing bottles..... No.	—	3
Earthen evaporating basins No.	20	8
Litmus paper..... Bundle	40	150
Glazed paper Sheet	—	9
Corks No.	20	—
Round wicks of lamps Bundle	—	9
Paraffin Gramme	550	900
Silvered paper Sheet	171	36
Varnish..... <i>Momme</i>	20	—
Beef <i>Kin</i>	42	—
Petroleum <i>Go</i>	670	260
Bean-curd refuse <i>Momme</i>	51,300	—
Eggs No	50	—
Mice No.	8	—

3. CHEMICALS, COLOURS ETC.

Articles	Quantities Consumed	Quantities Returned
Acidum aceticum glaciele Gramme	—	450
Acidum hydrochloricum Do.	650	6,450

Acidum nitricum	Gramme.	—	2,500
Acidum sulphuricum	Do.	3,375	4,050
Acidum sulphuricum crudum	Do.	2,000	—
Argenti nitras, crystal	Do.	15	140
Amylum	Do.	—	40
Amidol	Do.	38	28
Liquor ammoniæ.....	Do.	1,000	2,250
Acidum oxalicum	Do.	—	245
Acidum tannicum	Do.	20	—
Ether	Do.	3,000	3,600
Ammonii carbonas	Do.	220	—
Ammonii chloridum	Do.	680	450
Ammonium molybdate	Do.	10	15
Acidum pyrogallicum	Do.	—	194
Rosolic acid.....	Do.	25	—
Calcii chloridum	Do.	—	400
Calcii oxidum	Do.	—	900
Iodum	Do.	66	—
Potassa caustica	Do.	—	1,400
Potassii carbonas.....	Do.	900	900
Potassii bichromas	Do.	—	40
Potassii chromas	Do.	—	20
Potassii ferrieyanidum.....	Do.	20	—
Potassii ferroeyanidum	Do.	10	—
Potassii subnitras	Do.	40	—
Potassii permanganas	Do.	—	400
Iacetus	Do.	140	84
Auri chloridum	Do.	56	2
Baryta caustica	Do.	200	250
Barii chloridum	Do.	30	112
Petroleum benzin	Do.	1,200	450
Meta-diamid benzol.....	Do.	—	10

Articles	Quantities Consumed	Quantities Returned
Ammonii oxalas Gramme	152	—
Ammonium sulphide Do.	—	750
Ammonium thiocyanate Do.	324	—
Ammonium sulphate Do.	400	900
Phloroglucin Do.	—	20
Corrosive sublimate..... Do.	30	440
Hydrochinone Do.	261	140
Eikonogen Do.	—	10
Sodium bicarbonate..... Do.	200	—
Sodium ehlorate Do.	70	—
Sodium nitrite..... Do.	747	400
Sodium phosphate Do.	—	300
Sodium carbonate Do.	4,472	1,800
Sodium sulphite Do.	—	1,350
Sodium thiosulphate Do.	20,700	4,950
Sodium-potassium tartrate Do.	—	28
Chloroform Do.	28	372
Copper sulphate Do.	68	125
Grape sugar Do.	180	350
Diphenyl-amine Do.	7	8
Ferrous sulphide..... Do.	550	5,850
Ferrous sulphate..... Do.	50	50
Glycerin Do.	200	450
Mereury Do.	900	1,800
Brucine Do.	—	10
Phenylhydrazin Do.	—	28
Phenolphthalein Do.	5	—
Gelatin Do.	800	—
Alcohol Do.	90,500	72,000
Absolute alcohol Do.	1,450	900

Vanillin	Gramme	—	25
Xylol	Do.	84	872
Aniline oil	Do.	5	135
Oil of cloves	Do.	28	—
Cedar oil.....	Do.	56	—
Canada balsam	Do.	20	180
Celloidin	Do.	95	—
Potassium sulphocyanate.....	Do.	28	—
Magenta	Do.	25	—
Dahlia.....	Do.	20	—
Eosin	Do.	62	—
Orange G.	Do.	20	—
Carmine	Do.	20	—
Peptone	Do.	1,025	450
Caustic soda	Do.	—	900
Congo red	Do.	40	—
Fuchsin	Do.	90	50
Acid fuchsin	Do.	48	—
Methyl green	Do.	30	—
Gentian violet.....	Do.	20	—
Bismarek brown	Do.	25	—
Agar-agar	Do.	700	900
Indigo-carmine	Do.	25	—
Hæmatoxylin	Do.	32	—
Safranin	Do.	20	—
Methylene blue	Do.	220	—
Methyl-violet	Do.	25	—
Thionin	Do.	28	—

Chemicals and Colours not Specified in the Regulations.

Articles	Quantities Consumed	Quantities Returned
Acetic acid Gramme	50	—

Articles	Quantities Consumed	Quantities Returned
Pure zinc Gramme	—	850
Distilled water..... Do.	157,450	45,000
Citric acid Do.	300	—
Aniline Do.	47	—
Brucine sulphate..... Do.	15	—
Sulpho-salicylic acid Do.	30	—
Tropacolin Do.	28	—

SECTION IV. SUPPLY OF CLOTHING, PROVISIONS AND DRINKING WATER.

As regards hospital clothing, arrangements were originally made for 200 persons for each of the hospital ships, which was the estimated number of patients to be accommodated on each vessel. However Dr. Y. Ota, Surgeon in Command on board the *Saikio Maru*, thought the number would not suffice in practice, as no small number of patients suffering from infectious diseases might be brought in, thus necessitating the construction of temporary sick-rooms ashore. In view of this, he had extra clothing and tents provided in his ship for 50 more persons. Happily, however, his apprehensions were not realized.

The amounts of clothing for patients provided at the beginning of the war were as follows :—

Articles	<i>Kobe Maru</i>	<i>Saikio Maru</i>
Wadded long white garments	400	867
Unlined long white garments	400	1,073
Wadded long white garments for the insane ...	6	6
Unlined long white garments for the insane ...	6	6
Under shirts	200	433
Drawers	200	472
Belts	200	665
Cotton mattresses	200	214

Pillow covers	200	816
Bed sheets	400	380
Mosquito nets.....	—	100
Blankets	600	1,150
Japanese socks	200	200
Ventilators	—	6
Square tents	—	3
Round tents	—	2

Besides these, 180 pairs of leather slippers were provided in the hospital ships, as an article of ordinary expenses for the patients.

Provisions and nutritious foods for the use of patients were provided in the following quantities on each of the hospital ships:—

PROVISIONS.

Article	Quantity
	<i>KanMomme</i>
Biscuits.....	200.000
Preserved meat	150.000
Preserved fish	150.000
Rice	400.000
Cracked barley	120.000
Beans	15.000
Dried vegetables	50.000
Wheat flour.....	9.000
Tea	2.000
Parched barley	4.000
Sugar {refined	25.000
{unrefined	16.000
Sesame oil	5.000
Salt	9.000
Fat	5.000

Article	Quantity
Soy	^{Sho Shaku} 150.000
Vinegar	20.000

NUTRITIOUS FOODS.

Article	Quantity
Condensed milk	^{Kan Momme} 138.240
Somatose	0.800
Beef Extract	14.400
Butter	11.520
Arrow-root flour	14.000
Oatmeal	6.000
Vermicelli	33.000
Wheat flour.....	35.000
Canned mushrooms	34.560
Carrots (vegetable)	132.480
Strawberry jam	4.080
Black tea	3.000
Eggs.....	63.800
Red wine	^{Sho Shaku} 32.000

1 *Kan* is equivalent to 8.28 pounds.

1 *Momme* is equivalent to 1.325 ounce.

1 *Sho* is equivalent to 1.588 quart.

Rations for patients were allowed in conformity with Article LXXX. of the Naval Diet Regulations and with Clause 3. Article XIII. of the Detailed Rules of the Naval Diet Regulations for the Time of War. In addition, as extra allowance of 20 per cent was sanctioned, condensed milk and black tea could also be distributed.

The List of Food Articles for the Patients :—

Article	Quantity											
	No. 1.			No. 2.			No. 3.			No. 4.		
	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner
Bread	<i>Momme</i> —	<i>Momme</i> 65	<i>Momme</i> —	<i>Momme</i> —	<i>Momme</i> 50	<i>Momme</i> —	<i>Momme</i> 30	<i>Momme</i> —	<i>Momme</i> 30	<i>Momme</i> —	<i>Momme</i> —	<i>Momme</i> —
Biscuits	—	(50)	—	—	(40)	—	—	—	—	—	—	—
Meat with bone	—	60	—	—	60	—	—	—	—	—	—	—
Fish with bone	—	—	40	—	—	40	—	—	—	—	—	—
Rice	50	—	50	40	—	40	—	—	—	—	—	—
Cracked barley	17.5	—	17.5	14	—	14	—	—	—	—	—	—
Roasted barley	0.5	—	0.5	0.5	—	0.5	—	—	—	—	—	—
Vegetables	20	40	40	20	35	35	—	30	30	—	—	—
Condensed milk	—	—	—	6	6	—	—	(10)	(10)	(10)	(10)	(10)
Eggs	—	—	—	28	—	—	28	28	28	14	14	14
Meat for soup.....	—	—	—	—	—	—	50	—	50	50	50	50
Milk	—	—	—	—	—	—	—	50	50	50	50	50
Refined sugar	—	0.6	—	—	0.6	—	0.3	—	0.3	—	—	—
Rice for gruel	—	—	—	—	—	—	(20)	20	(20)	20	20	20
Tea	—	0.5	—	—	0.5	—	—	—	—	—	—	—

Remark :—The brackets in the list represent items which might be replaced by other articles of food.

The tanks for the special preservation of drinking water were originally three in number on each of the hospital ships. Those on the *Kobe Maru* had a capacity of 26 tons and those on the *Saikio Maru* one of 27 tons. There was a fear, however, that they might prove too small to give a sufficient supply of water, and consequently the *Kobe Maru* had been further fitted with five tanks large enough to contain 201 tons in all, of water for drinking and other purposes provided on the ship's bottom, and these tanks being replenished whenever the ship entered a home port, she was never short of water. The *Saikio Maru* had also 5 tanks containing 292 tons of water in all provided on the bottom for preserving water for drinking and sundry other purposes.

SECTION. V. THE MOVEMENTS.

I. Accommodation of sick and wounded at the front.

The *Kobe Maru* received her new fitting at the Kawasaki Dockyard, Kobe, in the beginning of the year 1904, and took on board her personnel and employes. Medical stores, coal, water, provisions and other necessities having next been taken in, she left the port and entered Sasebo, where she had her side painted as a hospital ship. She set sail from the Sasebo on February 7th, this, being her first trip as a hospital ship. Her trips were chiefly made to the localities in which the fleets were stationed. Here she would receive the sick and wounded, as many as she could conveniently carry, and would then sail back to a Naval Port at home to transfer them to Naval Hospitals. Then having replenished her supplies of coal, water, provisions and medical materials, she would set out on a new voyage to the front. In this way she accomplished 17 voyages between front and ports at home reckoning from the time of her first trip until November 5th, 1905.

The *Saikio Maru* began fitting out at Kure on February 11, 1904. The work of equipment as well as other preparations having been finished on the 27th of the same month, she left the port on the 28th following, and arrived at Sasebo on the 29th. On the 1st of March, she started on her first voyage, and undertook 17 trips between that time and November 12th, 1905.

The total number of patients who were received and treated during these voyages were as follows :—

The patients received on board the *Kobe Maru* amounted to 2,542, the number by days' reckonings being 24,960, and the average daily number of cases in hospital, 37.37. The actual number of patients who left the *Kobe Maru* recovered and had not to be transferred to a hospital ashore was 474; the patients who died on the ship numbered 88. The remaining 1,980 patients were transferred to the Naval Hospitals. A classification of these patients gives the following results :— Wounded in action 230, infectious diseases 196. Of the latter there were typhoid fever 104; dysentery, 88; measles, 2; epidemic cerebro-spinal meningitis, 1; diphtheria, 1. The cases of venereal diseases totalled 429; these cases were specially numerous at the beginning of the war and towards its conclusion.

On the *Saikio Maru*, the total number of patients actually received on board during the war was 2,374, the total by days, reckoning, 24,526, and the daily average, 38.62. The actual number of the patients who left the ship recovered without being removed to a hospital was 242, while deaths on board totalled 39. The remaining 2,093 patients were transferred to Naval Hospitals. The wounded in action number 255, and cases of infectious diseases, 196, including 85 cases each of typhoid fever and dysentery, 25 of measles and 1 of epidemic cerebro-spinal meningitis. The cases of venereal diseases numbered 252, these being found to occur more frequently during the first and the last stages of the war.

The following tables show the classification of patients according to the principal diseases among enlisted men of the Navy or others.

TABLE A. PATIENTS AMONG ENLISTED MEN OF THE NAVY WITH THEIR DISEASES CLASSIFIED.—*Kobe Maru*.

(From February 6, 1904, to November 5, 1905.)

Disease or Injury	Number of Patients	Days' Sickness	Recovered	Removed to Hospitals.	Deaths
General Diseases.....	325	3,280	73	241	11
Diseases of the Nervous System	91	948	24	66	1

Diseases of the Respiratory System	356	3,343	47	307	2
Diseases of the Circulatory System	36	451	23	13	—
Diseases of the Digestive System	256	2,319	93	160	3
Diseases of the Urinary and Generative Systems.....	96	917	24	72	—
Venereal Diseases.....	418	4,513	38	380	—
Diseases and Injuries of the Eye	45	440	5	40	—
Diseases and Injuries of the Ear	24	211	3	21	—
Diseases of the Skin and Connective Tissues.....	58	648	8	50	—
Diseases of the Organs of Locomotion	60	562	10	49	1
Injuries.....	346	2,885	42	246	58
Wounds received in actual Engagements	230	2,609	24	202	4
Other Wounds and Diseases (Drowning included).....	4	—	4	—	—
Total.....	2,345	23,126	418	1,847	80

N. B. The average days' sickness per case on board the hospital ship was 9.86.

The statistics in this table comprise 120 cases of officers and warrant officers.

**TABLE B. PATIENTS OTHER THAN THE ENLISTED MEN OF THE NAVY
WITH THEIR DISEASES CLASSIFIED.—*Kobe Maru*.**

(From February 6, 1904, to November 5, 1905.)

Disease or Injury	Number of Patients	Days' Sick-ness	Recovered	Removed to Hospitals	Deaths
General Diseases	57	486	5	47	5
Diseases of the Nervous Sys-tem	5	31	—	5	—
Diseases of the Respiratory System	14	104	4	10	—
Diseases of the Circulatory System	3	34	1	1	1
Diseases of the Digestive Sys-tem	15	126	7	8	—
Diseases of the Urinary and Generative Systems	12	144	9	3	—
Venereal Diseases.....	11	108	3	8	—
Diseases and Injuries of the Eye	4	25	2	2	—
Diseases of the Skin and Connective Tissue	5	54	3	2	—
Diseases of the Organs of Locomotion	3	15	1	2	—
Injuries.....	68	707	21	45	2
Total.....	197	1,834	56	133	8

N. B. The average days' sickness per case was 9.31.

**TABLE C. PATIENTS AMONG ENLISTED MEN OF THE NAVY WITH
THEIR DISEASES CLASSIFIED.—*Saikio Maru*.**

(From March 1, 1904, to November 25, 1905.)

Disease or Injury	Number of Patients	Days' Sick-ness	Recovered	Removed to Hospitals	Deaths
General Diseases	221	2,643	36	182	3
Diseases of the Nervous Sys-tem	72	792	5	66	1

Diseases of the Respiratory System	288	3,658	8	280	—
Diseases of the Circulatory System	36	446	1	35	—
Diseases of the Digestive System	227	2,941	49	178	—
Diseases of the Urinary and Generative System	60	668	20	40	—
Venereal Disease	238	2,813	12	226	—
Diseases and Injuries of the Eye	30	492	—	30	—
Diseases and Injuries of the Ear	22	257	—	22	—
Diseases of the Skin and Connective Tissues	29	393	6	23	—
Diseases of the Organs of Locomotion	64	706	8	56	—
Injuries.....	150	1,987	3	141	6
Wounds received in Battles	251	2,231	25	220	6
Total.....	1,688	20,027	173	1,499	16

N. B. The average days' treatment per case was 11.30.

The number in this table comprises 89 officers and warrant officers.

**TABLE D. PATIENTS OTHER THAN THE ENLISTED MEN OF THE NAVY
WITH THEIR DISEASES CLASSIFIED.—*Saikio Maru.***

(From March 1, 1904, to November 25, 1905.)

Disease or Injury	Number of Patients	Days' Sickness on Board the Hospital Ship	Recovered	Removed to Hospital	Deaths
General Diseases	182	1,497	18	144	20
Diseases of the Nervous System	7	84	1	6	—
Diseases of the Respiratory System	19	282	7	12	—
Diseases of the Circulatory System	3	47	—	3	—

Disease or Injury	Number of Patients	Days' Sickness on Board the Hospital Ship	Recovered	Removed to Hospitals	Death
Diseases of the Digestive System	35	355	24	10	1
Diseases of the Urinary and Generative Systems	4	29	1	3	—
Venereal Diseases.....	12	149	3	9	—
Diseases and Injuries of the Eye	6	98	1	5	—
Diseases of the Skin and Connective Tissue	8	148	5	3	—
Diseases of the Organs of Locomotion	4	76	1	3	—
Injuries.....	402	1,706	8	393	1
Wounds received in Battles	4	28	—	3	1
Total.....	686	4,499	69	594	23

N.B. The average number of days' treatment per case was 6.56.

The number in this table comprises 329 Russian captives and 103 Japanese soldiers.

II. Out-Patients.

Out-patients consisted of the men belonging to transports, the crews of the hospital ships, the crews of torpedo boats, etc. On the *Kobe Maru*, they reached 905 in extended number; on the *Saikio Maru*, 3,627.

III. The Receiving of Corpses on Board the Hospital Ships.

The numbers of corpses taken on board the hospital ships were 35 on the *Kobe Maru* and 63 on the *Saikio Maru*. They were the remains of men killed in battles or who had died of disease. When received, the corpse was first cleaned with 0.1 % corrosive sublimate solution, and the cavities of the nostrils, mouth, anus, etc., were stuffed with cotton wool moistened with the same solution. Then the corpse was dressed in the uniform or hospital garment, and placed in a coffin thickly sprinkled with lime, over which lime was again sprinkled so abundantly that the corpse was completely buried in the substance. In summer,

however, when corpses were liable to become putrid, they were generally subjected to cremation, and only the ashes were taken home in the careful way due to such remains.

IV. The Number of Operations.

The number of principal operations performed on board the *Kobe Maru* was 430 ; their courses and results were as follows :—

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 Days	21-30 Days	31-60 Days	Over 61 Days	Recovered	Improved	Died	Treatment Discontinued	
Nerve Suture	1	1	—	—	—	—	—	—	—	1	A case of mutilated right peroneal nerve accompanied with the extraction of foreign bodies.
Neurectasy (by operation)	2	—	1	1	—	—	—	—	—	2	Sciatica
Thoracotomy	1	1	—	—	—	—	—	—	1	—	A case of a blind gun shot wound extending from the thoracic region to the peritoneal cavity. Laparotomy and resection of ribs.
Extirpation of Aneurysm	1	1	—	—	—	—	1	—	—	—	
Removal of Lymphatic Glands.....	14	6	5	2	1	—	5	—	—	9	Tubercular adenitis of the cervical glands 8, and of axillary glands 1. Simple adenitis of the cervical glands 4, and that of inguinal glands 1.

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 Days	11-20 Days	21-30 Days	31-60 Days	Over 61 Days	Recovered	Improved	Died	Treatment Discontinued	
Radical Operation of Hernia.....	12	2	9	1	—	—	6	—	—	6	
Laparotomy...	16	10	3	2	1	—	5	—	4	7	Tubercular peritonitis 5, tubercles of mesenteric glands 1, blind gunshot wound extending from thoracic region to the peritoneal cavity 1, the intestinal obstruction 4, perityphlitis 4, and incised wound in the abdominal region 1.
Cholecystomy-the first Operation...	1	—	1	—	—	—	—	—	—	1	Gall-stone.
Cholecystotomy-the second Operation	1	—	1	—	—	—	—	—	—	1	Gall-stone.
Cholecystomy	1	—	1	—	—	—	—	—	1	—	Calculus in the gall-bladder and biliary ducts.
Cholodochotomy	1	1	—	—	—	—	—	—	1	—	Calculus in the biliary ducts. Cholodochotomy combined with cholecystotomy.
Syringotomy	14	8	4	2	—	—	1	—	—	13	

Operation for Piles	9	5	2	1	1	—	3	—	—	6	Ligature and removal 2, ligature cauterization etc. 7.
Radical Operation for Prolapsus Ani.....	3	3	—	—	—	—	2	—	—	1	Subcutaneous contraction method of the anus.
Operation for Fissura Ani	3	1	—	2	—	—	—	—	—	3	
Castration ...	7	3	4	—	—	—	2	—	—	5	Unilateral tubercular epididymitis 3, bilateral tubercular orchitis 1, cystic testicles and 2 cases of syphilitic orchitis.
Radical Operation for Hydrocele Testis	6	1	5	—	—	—	4	—	—	2	Some were accompanied by varicocele.
Enucleation of Venereal Bubo	140	73	52	12	3	—	34	—	—	106	
Incision of Venereal Bubo	40	16	15	9	—	—	1	—	—	39	
Enucleation of the Eye ...	1	—	1	—	—	—	1	—	—	—	
Mastoidectomy ...	1	1	—	—	—	—	—	—	—	1	
Incision of Abscess ...	22	13	6	3	—	—	2	—	—	20	

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 Days	11-20 Days	21-30 Days	31-60 Days	Over 61 Days	Recovered	Improved	Died	Treatment discontinued	
Resection of Ribs	4	2	1	—	1	—	—	—	1	3	Caries of the ribs 3, blind gunshot wound extending from the thoracic region to the peritoneal cavity 1.
Plaster of Paris bandage	3	1	2	—	—	—	—	—	—	3	Caries of the lumbar vertebra 1, fractures 2.
Incision of Myositis ...	6	4	2	—	—	—	—	—	—	6	
Separation of Adhesion of Muscles and Tendons ...	1	—	—	1	—	—	—	—	—	1	
Suturing of Wound and Forming of Counter-openings ...	2	2	—	—	—	—	—	—	—	2	1 case of punctured wound and 1 case of contused wound.
Paring Bones with Chisel.	4	2	2	—	—	—	1	—	—	3	Osteo-sarcoma 1, fracture of the skull 3.
Suturing of Fractured End of Bones	4	2	1	1	—	—	1	—	—	3	Cases of the compound fracture of the lower jaw, with silver wire.

Reduction and Permanent Dressing of Fractures ..	9	1	4	2	2	—	—	—	—	9	The fractures of the femur 4, the fracture of the humerus 1, of the radius and ulna 1, of ribs 2, of phalanges 1.
Paring of Fractured Ends.	6	4	1	1	—	—	—	—	—	6	Stump of the amputated femur 2, ilium 2, stump of the amputated elbow joint 2.
Amputation ...	12	6	1	5	—	—	2	—	—	10	The leg 1, the forearm 1, the metatarsus of the great toe 1, index finger 3, the middle finger 2, and the ring finger 2.
Reduction of Dislocation.	2	—	1	1	—	—	—	—	—	2	
Disarticulation	3	2	1	—	—	—	—	—	—	3	The thumb 1, forefinger 1, and the middle finger 1.
Extraction of Foreign Bodies by Enlarging the Entrance of the Wound.	34	20	5	9	—	—	5	—	1	28	Shell fragments, iron pieces, etc., in 26 cases and wooden splinters, pieces of clothes, etc., 8.
Trephining ...	1	—	1	—	—	—	—	—	—	1	Cerebral abscess from nose disease.
Radical Operation for the Hypertrophic Rhinitis	4	4	—	—	—	—	1	—	—	3	

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 Days	11-20 Days	21-30 Days	31-60 Days	Over 61 Days	Recovered	Improved	Died	Treatment Discontinued	
Meatotomy ...	1	1	—	—	—	—	—	—	—	1	Congenital stricture of the meatus.
Operation for Phimosis ...	3	3	—	—	—	—	2	—	—	1	
Incision of Tumors ...	3	—	3	—	—	—	3	—	—	—	
Osteotomy ...	8	5	2	1	—	—	1	—	1	6	
Reduction of Dislocated Shoulder Joint	1	—	—	1	—	—	—	—	—	1	
Arrest of Haemorrhage and Suturing	8	3	3	2	—	—	4	—	—	4	Subcoracoid dislocation.
Tendorrhaphy	1	—	—	1	—	—	—	—	—	1	
Removal of Cicatrix ...	1	1	—	—	—	—	—	—	—	1	
Resection of Muscles ...	1	1	—	—	—	—	—	—	—	1	
Removal of Varix	3	2	1	—	—	—	2	—	—	1	
											Atrophy of the pectoral muscles.
											1 case of circumscribed phlebitis and 1 case of varicocele.

Incision of the Phlegmon- ous Cellulitis	8	3	5	—	—	—	—	—	—	8
Total...	430	215	146	60	9	—	89	—	10	331

REMARK:—Operations mentioned in this table were mainly performed under anesthetization

In case a single individual had several kinds of wounds at a time—for instance, a blind gun-shot wound, a contusion and a contused wound,—even if he recovered from the first wound by the extraction of the shell-fragment, the other wound remaining un cured he was transferred to some other hospital; patients of this kind are not enumerated in the column of “Recovered” in the above table, but in the column of “Treatment Discontinued.”

Thus it will be seen that “Treatment Discontinued” means such patients as were removed to Naval Hospitals ashore.

The number of principal operations, performed on board the *Saikio Maru* was 397; their courses and results were as follows:—

Name and Character of Operation	Number of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Above 61 days	Recovered	Improved	Died	Treatment discontinued	
Removal of Nasal Polypi.	3	2	1	—	—	—	1	—	—	2	
Tracheotomy ..	1	1	—	—	—	—	—	—	—	1	A case of a perforated gun-shot wound in the neck, the larynx being pierced through.
Extirpation of Traumatic Aneurism ...	1	1	—	—	—	—	—	—	—	1	Aneurism of the posterior tibial artery consequent on a blind wound caused by a bullet.

Name and Character of Operation	Number of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Above 61 days	Recovered	Improved	Died	Treatment Discontinued	
Enucleation of Cervical Gland	2	1	1	—	—	—	—	—	—	2	Cases of suppurative lymphadenitis.
Enucleation of the Inguinal Gland	2	1	1	—	—	—	1	—	—	1	
Enucleation of the Axillary Gland	1	1	—	—	—	—	—	—	—	1	
Syringotomy ..	19	6	8	4	1	—	—	8	—	11	Cases of the suppurative lymphadenitis of the right axillary gland.
Excision of Piles	14	8	6	—	—	—	2	5	—	7	
Cauterization of Piles	2	1	1	—	—	—	—	1	—	1	
Cauterization of Ulcer of the Rectum	3	1	—	1	1	—	—	—	—	3	
Excision of the Hypertrophied-skin around the Anus	3	1	1	1	—	—	—	1	—	2	
Incision of Rectal Abscesses.	13	6	3	3	1	—	—	2	—	11	

External Urethrotomy.....	1	1	—	—	—	—	—	1	—	—	For stricture.
Operation for Paraphimosis .	2	2	—	—	—	—	—	—	—	2	Cases resulting from hard chancre, on which Rosel's operation was performed.
Radical Treatment of Hydrocele of the Spermatie Cord	1	1	—	—	—	—	1	—	—	—	
Puncture of Bubo	33	17	11	4	1	—	3	—	—	30	After evacuating the pus by puncturing, iodoform glycerine was injected.
Incision of Bubo	30	14	10	3	3	—	—	3	—	27	
Enucleation of Bubo	25	13	12	—	—	—	6	2	—	17	
Extraction of Luxated Crystalline Lens...	1	1	—	—	—	—	—	—	—	1	The lens of the left eye dislocated and lodged in the anterior chamber, consequent on a shell wound.
Evisceratio Bulbi	2	2	—	—	—	—	—	—	—	2	A case of gunshot wound in the left eye and another of contused wound in the cornea of the right eye.
Puncture of Tympanic Membrane ...	1	1	—	—	—	—	—	—	1	—	A case of acute meningitis.
Scooping of Ulcer in the Sole of a Foot	1	—	1	—	—	—	1	—	—	—	

Incision of a Cold Abscess the Back of Foot.	1	—	1	—	—	—	—	—	—	1	A case of abscess on the right foot consequent on a contused wound.
Extirpation of Ranula.	1	1	—	—	—	—	—	—	—	1	
Extirpation of Dermoid Cyst.	1	1	—	—	—	—	1	—	—	—	
Excision of Ribs.	3	2	—	—	1	—	—	—	—	3	Caries of ribs.
Incision of Myositis.	3	—	2	1	—	—	1	1	—	1	1 for the right serratus magnus, 2 for left pectoralis major muscle.
Tendorrhaphy	2	1	1	—	—	—	—	—	—	2	
Suturing of Contused Wounds in the Fore-Head ...	2	—	1	1	—	—	2	—	—	—	One was a case of secondary suture.
Suture of Contused Wound of Bridge of the Nose.....	1	1	—	—	—	—	—	—	—	1	
Suture of Contused Wounds in the Face....	2	2	—	—	—	—	—	1	—	1	One case of compound fracture of the upper and lower jaw, and one case of contused wounds of the ala nasi, lips, and cheeks.

Name and Character of Operation	Number of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Above 61 days	Recovered	Improved	Died	Treatment Discontinued	
Suture of a Contused Wound in the Parietal Region	4	3	1	—	—	—	2	1	—	1	
Suture of a Contused Wound in the Temporal Region	1	1	—	—	—	—	—	—	—	1	
Suture of a Contused Wound in the Back	1	—	—	1	—	—	—	—	—	1	
Suture of a Contused Wound in the Lumbar Region	1	1	—	—	—	—	1	—	—	—	
Suture of Contused Wounds in the Fore-arm.....	2	1	1	—	—	—	1	—	—	1	
Suture of Contused Wounds in the Thumb.	2	—	2	—	—	—	1	—	—	1	

Suture of Contused Wound in the Middle Finger	2	1	—	1	—	—	1	—	—	1	One case of a compound fracture of the phalanx III. of the right middle finger and one case of contused wound of the left middle finger.
Suture of a Contused Wound in the Ring Finger.	1	1	—	—	—	—	—	—	—	1	A case of contused wound in the palmar surface of the right ring finger.
Suture of a Contused Wound in the Leg	1	—	1	—	—	—	1	—	—	—	
Suture of Contused Wound on the Back of the Right Foot	1	1	—	—	—	—	—	—	—	1	
Suture of Mutilated Wound in the Left Small Finger.	1	1	—	—	—	—	—	—	—	1	
Incision of Contused Wounds	8	5	3	—	—	—	1	1	—	6	
Incision of Punctured Wounds on the Back.	1	—	1	—	—	—	—	—	—	1	A case of punctured wound on the right side of the back. The incision was performed for arresting haemorrhage.

Name and Character of Operation	Number of Cases	Duration of Treatment after Operation					Results				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Above 61 days	Recovered	Improved	Died	Treatment Discontinued	
Bone Scraping in a Bullet Wound in the Parietal Region	1	1	—	—	—	—	—	—	—	1	A case of perforating wound attended by fracture caused by a bullet in the right parietal region, in which mental derangement resulted.
Suture of Bullet Wounds....	6	1	5	—	—	—	1	—	—	5	
Excision of Bone in Gun-shot Wound in the Upper Arm	1	1	—	—	—	—	—	—	—	1	
Excision and Scooping of Bone in Shell Wounds	12	5	4	3	—	—	—	7	—	5	A compound fracture attending a gun-shot wound in the upper arm.
Incision of Shell Wounds.	24	12	8	3	1	—	3	—	—	21	
Suture of Shell Wounds.	26	20	4	2	—	—	3	7	—	16	

Disarticulations	20	15	3	2	—	—	4	3	—	13
Amputation of the Upper Arm	5	3	1	1	—	—	1	1	—	3
Amputation of the Thumb...	2	1	—	1	—	—	1	—	—	1
Amputation of the Index Finger	3	2	—	—	1	—	1	—	—	2
Amputation of the Middle Finger.....	3	3	—	—	—	—	2	1	—	—
Amputation of the Ring Finger	3	2	1	—	—	—	2	—	—	1
Amputation of the Leg	1	—	1	—	—	—	—	—	—	1
Amputation of the Thigh ...	1	1	—	—	—	—	—	—	—	1
Extraction of Shell-Fragments	33	29	3	1	—	—	1	1	—	31
Extraction of detached Bone Pieces	14	12	2	—	—	—	—	—	1	13
Extraction of Torn Pieces of Clothes	1	1	—	—	—	—	—	—	—	1
Skin Grafting.	2	2	—	—	—	—	2	—	—	—
Suture of Subcutaneous Rupture of the Urethra	1	1	—	—	—	—	—	—	—	1

A case of compound fracture in the right thigh.

[illegible]

Incision and Scooping of Caries on the Sternum	1	—	—	1	—	—	—	—	—	1
Trimming the Margins of Wounds	3	1	2	—	—	—	—	—	—	3
Extraction of Foreign Bodies	2	—	1	—	1	—	—	—	—	2
Total.	397	230	117	38	12	—	51	48	2	296

V. Preventive Measures Against Infectious Diseases.

The articles subjected to disinfection on the hospital ships at the request of other vessels or boats were very numerous. The following table shows the kinds and numbers of those articles :—

Article.	Number.	
	<i>Kobe Maru.</i>	<i>Saikio Maru.</i>
Blankets	3,428	1,836
Bags	705	493
Hammocks	178	522
Chair covers	6	—
Curtains	40	—
Handkerchiefs	2	—
Straw beds	6	630
Towels	16	—
Working rigs	1,206	—
Waistcoat	1	—
Drawers	42	—
Operation gowns	18	—
Quilted garments	3	439

Article.	Number.	
	<i>Kobe Maru.</i>	<i>Saikio Maru.</i>
Single garments	52	500
Bed sheets	65	1,020
Belts	5	483
Undershirts.....	41	349
Trousers	2	327
Pillows	26	340
Pillow covers	6	561
Cap covers	7	—
Stretchers	21	14
Stretcher cover	1	—
Mattresses	387	322
Mattress covers	182	—
Jackets (blue).	30	—
Straw mats.....	70	—
Articles wrapped in <i>furoshiki</i> *	—	281
Wicker-trunks	—	151
Cold-weather coats	—	20
Sundry articles	—	18
Total.....	6,546	8,306

* A square cloth wrapper of varying in size.

In giving disinfection to a ship or a boat, first the clothing then worn by the crews of the ship or boat were taken off and subjected to disinfection in one of the hospital ships, while the crew put on new clothing. When the process of disinfection was nearly finished, a signal was made to the ship or boat to the effect that every one on board should take a bath, and after the bath they were made to put on the disinfected clothes, which had been sent back to the vessel by that time. The clothing which had been worn before they took the bath was likewise sent to the hospital ship in a mass for disinfection. Before

taking the bath, all the members of the vessel were ordered to remove their things—bags, hammocks, etc.—to the upper deck and to leave their rooms empty.

The rooms thus left empty were then disinfected, by men sent from the hospital ship for the purpose, with 5 % solution of carbolic acid through a Yonezawa high pressure spray apparatus. Then the bags, hammocks, etc. removed to the upper deck were sent in batches to the hospital ship to be subjected to steam disinfection. All leather and rubber goods, which would not bear steam disinfection, were sprinkled over with the aforesaid solution of carbolic acid and then exposed to the sun, on the upper deck of the ship or boat. Not only the galley and closets but every nook and corner of the ship or boat was disinfected with carbolic acid solution. The water tanks were disinfected by steam, the water inside being heated to the temperature of 80°C. or above, and left there for several hours.

The ships and boats thus disinfected were a converted cruiser, 6 converted gunboats and several torpedo boats, on board of which cases of contagious diseases had occurred.

VI. Chemical Examinations.

The chemical examinations performed on board the *Kobe Maru* numbered 147, of which 57 were on drinking water, 30 on water for which application had been made by other vessels and for the mere sake of information, two on ice, two on urine, four on provisions, 18 for ascertaining the existence of poisonous materials, 32 for the estimation of carbon dioxide in the air, and one on a certain other article.

The total number of chemical examinations performed on the *Saikio Maru* was 94, of which three were made on drugs, 56 on drinking water, 12 on water for boilers, one on ice, two on food, four on beverages, five on provisions, eight on tinned food, two for the estimation of carbonic acid gas in the air, and one for determining the existence of poisonous substances.

SECTION VI. IMPERIAL MESSENGERS AND GIFTS, AND CONTRIBUTIONS FROM THE GENERAL PUBLIC.

His Majesty the Emperor was pleased to send Messengers of inquiry to

both hospital ships respectively three times during the war, to inquire after the condition of the patients on board the vessels. On such occasions the messengers conveyed with them Imperial Gifts for the patients in the shape of money and other articles.

Her Majesty the Empress, Their Highnesses the Crown Princess and Princess Arisugawa were also pleased to grant the patients bandages made by their own hands, from time to time.

The presents in money and kind from the benevolent public to the Hospital ships, *Kobe Maru* and *Saikio Maru*, were as follows :—

Articles	Quantity	Articles	Quantity
Books, journals, etc.....Copies	15,889	Surprise bags.....No.	472
Religious picture cards. Leaves	97	Picture cards .....Pieces	3,419
Cotton cloth .....Tan	70	Note paper .....Sheets	732
Absorbent cotton wool.....lb.	3	Envelopes .....Bundles	43
Daily newspapers (for 9 months and a half)...Kinds	14	Writing brushes .....No.	100
English newspapers ...Copies	10	Ink-sticks .....A certain number.	17
Bandages .....Rolls	12,694	Pencils .....No.	
Toilet paper .....Sheets	124	Japanese paper	
Cotton gauze .....Tan	360	(<i>Hanshi</i>).....Quires	58
Cotton wool.....lb.	25	Japanese folding fans.....No.	730
Lint .....lb.	25	Summer caps for patients. No.	2
Carbolic acid .....lb.	1	Handkerchiefs .....Piece	891
Drugs .....Kind	22	Japanese socks .....Pairs	73
Dentifrice .....Cases	10	Stockings .....Pairs	24
Cotton gauze bandages ...Roll	576	Summer shirts.....Pieces	25
Triangular bandages ...Sheets	50	Flannel night gowns ...Suits	53
Crutches .....No.	11	Japanese towels .....Pieces	988
Vaccine for erysipelas. Bottles	32	European towels .....Pieces	22
Euguform .....Gramme	500	Cigarettes .....No.	8,340
		Cigars .....No.	7

Red wine	Bottles	120	Records	No.	47
Champagne	Do.	6	Paper organ	No.	1
Beer	Do.	24	Organ	No.	1
Whisky	Do.	8	Furniture and utensils to be used in funerals and other religious services.....	Sets	2
Sherry.....	Do.	2	Foreign toys	Set	1
<i>Sake</i> (Japanese wine)	Do.	255	" Wrestling " chess.....	Set	1
Japanese ruled paper ..	Sheets	100	" Army march " chess ...	Sets	2
Confectionery.....	Bags	3	Artificial flowers	Bundle	1
Citrons	Bottles	1,200	Flower vases	No.	3
Oranges	Pieces	550	Sundry articles	Kinds	8
Hominy	Bags	30	Money in cash.....	Y.	6.80
Marsh-mallow	Cases	4	Bleached cotton cloth.....	<i>Tan</i>	276
Cherries	lb.	130	Postal cards.....	Pieces	60
<i>Chosen ame</i> (rice jelly)	Pieces	100	Crepe shirts	No.	24
<i>Narazuke</i> (a kind of Japanese pickled vegeta- bles)	Cask	1	Persimmons	Casks	2
Pickled vegetables	Do.	1	Fans	No.	30
Pickled plums.....	Do.	to* 1	Sweetmeats	Cases	11
Soap	No.	33	Peas	Bags	7
Magic lantern apparatus. No.		1	Fat	Cases	4
<i>Masamune</i> (<i>sake</i>) in bottles	Bottle	98	Arrow root flour	<i>Kan</i>	1
<i>Hirano</i> water.....	Bottles	144	Sugar	Cases	7
Phonography	No.	2	Corne'd beef	Do.	2

* *To* is equivalent to 10 *sho*.

1 *to*=3.9703 gallons.

* *kan* is equivalent to 8.28 pounds.

**SECTION VII. THE EXPENSES FOR EQUIPMENT, REPAIRS AND
SANITARY ARRANGEMENT OF THE HOSPITAL SHIPS.**

The expense of sanitation etc., are shown in the following table :—

Section	Sub-Section	Item	Article	<i>Kobe Maru</i>	<i>Saikio Maru</i>
War expenses				¥22,690.840	¥22,278.776
	Provision expenses			¥ 7,263.872	¥ 9,347.699
	Clothing expenses			¥ 171.205	¥ 592.950
	Expenses for patients			¥14,800.763	¥11,103.631
		Expenses of medical articles		¥ 8,322.170	¥ 3,959.287
			Non-consumptive articles	¥ 3,565.599	¥ 573.563
			Consumptive articles	¥ 4,756.571	¥ 3,385.724
		Expenses for Drugs		¥ 3,723.793	¥ 3,378.825
		Expenses for custody and transportation of medical articles		¥ 747.880	¥ 984.640
			Payment for employés	¥ 747.880	¥ 984.640
		Expenses pertaining to sick ward		¥ 2,006.920	¥ 2,780.879
			Payment for employés	¥ 1,900.920	¥ 2,398.730

Expenses for naval store	Naval stores	Articles for miscellane- ous use	¥ 106.000	¥ 382.149
			¥ 455.000	¥ 1,234.496
			¥ 455.000	¥ 1,234.496
		Non-consump- tive articles	¥ 50.000	—
		Consumptive articles	¥ 405.000	¥ 1,234.496

The expenses of repairs and reconstructions were ¥ 25,600.526 for the *Kobe Maru*, and ¥ 39,182.077 for the *Saikio Maru*, the particulars being as follows :—

	<i>Kobe Maru</i>	<i>Saikio Maru</i>
Cost of equipment	¥ 11,546.130	¥ 17,560.267
Cost of repairs.....	¥ 9,586.228	¥ 8,309.833
Expenses required at the engi- neering branch.....	¥ 4,468.168	¥ 13,311.977
Total.....	¥ 25,600.526	¥ 39,182.077

SECTION VIII. CRITICISMS OF THE HOSPITAL SHIPS.

In concluding the present chapter, we take pleasure in recording the interesting views concerning the hospital ships expressed by Dr. Y. Ota, who had many opportunities of treating the sick and wounded, in his capacity of Chief Surgeon on board the *Saikio Maru* throughout the late war.

(1) The Value of the *Saikio Maru* as a Hospital Ship :—As the space on the *Saikio Maru* was cramped, the wards had to accommodate both serious and slight cases at the same time, with the result that the former were prevented from taking quiet rest, while the latter were naturally under a certain amount of constraint. A recreation room would have been no small boon to

patients who were not very ill, but unhappily the ship was not spacious enough to allow of such an establishment. Owing to this lack of capacity, the wards were often filled to overflowing, so that she was compelled to make frequent voyages home, and no sufficient time was allowed for giving satisfactory treatment to the patients. To our great regret, the ship often seemed to be merely fulfilling the duties of a transport for the conveyance of sick and wounded. Such being the case, we should hesitate to assert that she at any time discharged her full duties as a hospital ship belonging to a large fleet. And it is our sincere hope that in the future vessels of much larger capacity will be used for hospital purposes.

(2) Night Signals :—While Port Arthur was being blockaded by our fleets, the *Saikio Maru* was more than once obliged to approach as near to the seat of conflict as Yüentaow, where she was overtaken by night. On such occasions it sometimes happened that a despatch-boat communicated an order to us by a night-signal. The electric signalling instruments, however, being considered weapons of war, were not installed on our ship, and we were unable to signal back, to the great hindrance of our work. It is our firm conviction that it is of paramount importance to have a special kind of a night-signalling instrument installed on hospital ships in the future.

(3) Distinctive Signs for Night Use :—In the naval engagements during the late war, the enemy's ships were almost always obliged to assume the defensive, and our hospital ships scarcely ever had to expose themselves in dangerous positions despite the absence of any distinctive signs to denote their character. Had the situation, been reversed and had the enemy's fleets made assaults on our base of operations, our hospital ships would have been exposed to peril. For example, at the engagement in the Yellow Sea fought on August 10th, 1904 which turned into a mêlée at fall of night, the enemy's hospital ships followed their fleet. On this occasion, it repeatedly happened that our destroyers and torpedo boats were on the point of attacking these ships before making the discovery that they were non-combatant and privileged vessels.

Such luck cannot always be expected in the confusion of a night attack. We, therefore deem it advisable for a hospital ship to have a suitable distinctive

device ready for night use. For instance, there might be an electric light displayed from some conspicuous place such as the top of a funnel.

(4) The Operating Room and the Infectious Ward :—The operating room being placed at the after part on the upper deck was found to be very susceptible to the trembling of the ship, which often obliged us to suspend surgical operations, much to our inconvenience. The infectious disease rooms being also located at the fore and after parts were likewise subject to much motion, to the discomfort of the patients. The heavy motions of the steam-laundry, also, affected all the contiguous parts of the ship. The rest of the patients in the infectious ward situated immediately below the laundry, was much disturbed thereby.

(5) The Bedsteads :—The bedsteads, which were made of wood, were found to have two disadvantages. A wooden frame naturally takes up more space than e.g. one of iron, and it is hard to disinfect it satisfactorily. We hope that, in the future, all bedsteads will be made of iron.

CHAPTER III.

NAVAL HOSPITALS.

SECTION I. GENERAL REMARKS.

It was on the 6th of February, 1904, that the preparations were commenced for the reception of the sick and wounded as also for the necessary supply of medical stores at the Naval Hospitals at Sasebo, Kure, Yokosuka, and Maidzuru. Of these, the Sasebo Naval Hospital, being situated in the most important position, was already fully occupied by patients before the outbreak of hostilities, so that the necessity began to be felt for opening new wards. In the hospitals at Sasebo, Kure, and Maidzuru, purchases of supplies for the patients were made to the amount *yen* 12,700 for Sasebo, *yen* 8,493.50 for Kure, and *yen* 3,806.50 for Maidzuru; and the progress of the war saw the opening of new wards in the above named hospitals as also in Takeshiki Sick Quarters, the new arrangement of the interiors, the establishment of new quarantine stations, etc.

As to the Port Arthur Naval Hospital it was instituted soon after the capitulation, the appointment of a medical corps having been made on the 2nd of January, 1905. Surgeon General K. Sudzuki, as director, with a staff of sixty two, left Sasebo on the 29th of the same month, and arrived at the port on the 4th of February following.

The hospital was temporarily opened within the building formerly occupied by the Russian Division of Marines; on the 25th July it was removed to the site of the former Russian Naval Hospital in the New Town.

The following will show the number of the sick and wounded actually admitted into each Naval Hospital and into the Takeshiki Sick Quarters during the war of 1904-5, with a summary of current expenses for each hospital, as also of the donations and contributions made thereto:—

Number of Patients admitted into Naval Hospitals and
Takeshiki Sick Quarters.

Names of Hospitals	No. of Ward-Pavilions belonging to Each	Maximum Admission	No. of Temporary Wards	Maximum Admission
Sasebo Naval Hospital.....	7	270	5	389
Kure Naval Hospital.....	6	280	5	519
Yokosuka Naval Hospital ...	7	318	1	80
Maidzuru Naval Hospital ...	3	75	1	120
Takeshiki Sick Quarters	1	20	4	146
Port Arthur Naval Hospital...	5	240	—	—
Total.....	29	1,203	16	1,254

Remarks:—Under Kure Hospital, the number of wards includes the captured Hospital Ship *Orel* which was numbered as 1. The ship was used in consequence of the severe earthquake which took place soon after the engagement at the Japan Sea.

Number of Patients Admitted into Hospitals during
the Campaign.

Name of Hospital	No. of Patients received	Prisoners and other Foreign Patients	Total	No. of Days' Sickness	Average No. per Day
Sasebo Naval Hospital	5,080	435	5,515	189,917	307.3
Kure Naval Hospital	2,902	—	2,902	159,066	256.9
Yokosuka Naval Hospital	2,013	—	2,013	91,270	147.7
Maidzuru Naval Hospital	1,028	52	1,080	57,380	92.8
Takeshiki Sick Quarters	924	—	924	25,026	40.5
Port Arthur Naval Hospital	513	—	513	19,089	80.5

Remarks:—Port Arthur Naval Hospital dates from 22nd February, 1905, when it was first opened in the building of the Russian Marine Barracks.

The expenses for office, patients' keep, provisions, clothing, new buildings and

repairs, defrayed out of the current expenses and from the Extraordinary War Fund etc., amounted in the aggregate to *yen* 936,825.752.

The expenses of each Naval Hospital stand as under :—

Sasebo Naval Hospital	<i>Yen</i> 390,775.804
Kure Naval Hospital.....	„ 239,613.914
Yokosuka Naval Hospital.....	„ 144,162.883
Maidzuru Naval Hospital.....	„ 145,536.255
Port Arthur Naval Hospital	„ 13,212.665
Takeshiki Sick Quarters.....	„ 3,524.231
Total	„ 936,825.752

Remarks:—Port Arthur Naval Hospital received, in addition to the sum in the above list, goods to the value of *yen* 10,608.558 from the Sasebo Medical Depôt; and this sum is given included under the heading of Sasebo Naval Hospital, Takeshiki Sick Quarters, also received in goods from the same depôt, a large portion of the expenses of its patients.

As shown below, Imperial Solicitude was frequently bestowed upon the sick and wounded at hospitals by sending messengers of inquiry, who brought with them Gifts from their Majesties which brought tears of gratitude to the eyes of many a sufferer.

Name of Hospital.	Date of Inquiry.	Names of Messengers.	Notes.
Sasebo Naval Hospital	20th. Feb., 1904.	G. Oki, A.D.C. to H.M. the Emperor and K. Kuromidzu, ditto, to H. H. the Crown Prince.	(donations.) Some cheer in money to the wounded in action at the first attack upon Port Arthur.
„	23rd. Apr., 1904.	R. Inouye, A.D.C. to H.M. the Emperor and K. Kuromidzu, ditto, to H.H.the Crown Prince.	Some cheer in money to the wounded in action at the blockading and engagements off Port Arthur.
„	17th. Aug., 1904.	Oki, A.D.C. to H.M. the Emperor and Kuro-midzu, ditto, to H.H.the Crown Prince.	Some cheer in money to the wounded in actions on the Yellow Sea and off Ulsan.
„	16th, Nov. 1904.	Oki, A.D.C. to H.M. the Emperor.	Some cheer in money to the sick and wounded from the front.
„	10th. Dec., 1904.	Kitajima, Court Lady of Second Rank.	Words of solicitude from H.M. the Empress to the wounded in general.

Sasebo Naval Hospital	5th. Jun., 1905.	R. Inouye, A.D.C. to H.M. the Emperor and Kuromidzu, ditto, to H. H. the Crown Prince.	Some cheer in money to the wounded in the battle of the Japan Sea.
Kure Naval Hospital	12th. July, 1904.	Takatsukasa, A.D.C. to H.M. the Emperor.	Words of solicitude to the sick and wounded.
"	10th. Nov., 1904.	Oki, A.D.C. to H.M. the Emperor and Kuromidzu, ditto, to H.H.the Crown Prince.	Words of solicitude to the sick and wounded from the front.
"	6th. Dec., 1904.	Kitajima, Court Lady of Second Rank.	Words of solicitude to the sick and wounded in general.
"	24th, June, 1904.	Oki, A.D.C. to H.M. the Emperor.	Some cheer in money to the sick and wounded from the front.
"	12th. Dec., 1905.	Kuromidzu, A.D.C. to H.H.the Crown Prince.	Some cheer in money to the sick and wounded from the front.
Yokosuka Naval Hospital..	5th. Nov., 1904.	Oki, A.D.C. to H.M. the Emperor.	Some cheer in money to the wounded in action.
"	19th, Dec., 1904.	Oki, A.D.C. to H.M. the Emperor.	Some cheer in money to the sick and wounded from the front.
"	10th, Jan., 1905.	Kitajima, Court lady of Second Rank.	Words of solicitude to the sick and wounded in general.
"	4th, July, 1905.	Oki, A.D.C. to H.M. the Emperor.	Some cheer in money to the sick and wounded from the front.
"	29th. July. 1905.	Kuromidzu, A.D.C. to H. H. the Crown Prince.	Some cheer in money to the sick and wounded from the front.
Maizuru Naval Hospital.	20th. Nov., 1904.	Oki, A.D.C. to H.M. the Emperor.	Some cheer in money to the wounded in action.
"	19th. Dec., 1904.	Court Lady Kitajima.	Words of solicitude from H.M. the Empress to the wounded and the sick.
"	30th. Jun., 1905.	Oki, A.D.C. to H.M. the Emperor.	Some cheer in money to the wounded and sick from the front.
Takeshiki Sick Quarters	29th. Apr., 1904.	Inouye, A.D.C. to H.M. the Emperor.	Some cheer in money to the wounded in discharge of duty.
"	30th. Aug., 1905.	Kuromidzu, A.D.C. to H.H.the Crown Prince.	Some cheer in money to the wounded in discharge of duty.

Name of Hos- pital.	Date of Inquiry.	Name of Messngers.	Notes.
Takeshiki Sick Quarters.....	14th. Jun., 1904.	Oki, A.D.C. to H.M. the Emperor	Some cheer in money to the wounded and sick in general.
„	21st. Dec., 1904 and 23rd. Mar., 1905.		Some cheer in money to the bedridden in general from their Majesties H.H. the and Crown Prince.
Port Arthur. Naval Hospital.	July 1905.	A.D.C. to H.M. the Emperor.	Some cheer in money to all the patients in the hospital.

In addition to the above, Her Majesty the Empress and Her Highness the Crown Princess were gracious enough to favour the wounded naval officers and men at the hospital with the Gift of bandages of their own making. At each hospital the utmost care was taken to have the Imperial will fulfilled by using a large part of the Gifts for the wounded in action, and also a part for the wounded in discharge of duty.

Their Highnesses Princess Tsune and Kane, as well as Princess Arisugawa, graciously condescended to make with their own hands bandages for Gifts, which were made use of with equal care at the hospital, as shown below :—

Name of Hospital	Quantity of Bandages, Gift of Empress and Crown Princess	Quantity of Bandages, Gift of Princesses Tsune and Kane	Quantity of Bandages Gift of Princess Arisugawa
Sasebo Naval Hospital	80 cans containing roller bandages of gauze and bleached cotton (each can containing 12).	40 cans containing roller bandages, 10 in each can.	100 cans containing roller bandages, and 50 cans of triangular bandages.
Kure Naval Hospital	50 cans, the same as above.	250 roller bandages.	The same as above.
Yokosuka Na- val Hospital...	10 cans, the same as above.	20 cans of roller band- ages, 10 in each can.	100 roller bandages, 50 pieces of triangular bandages.
Maidzuru Na- val Hospital...	20 cans, the same as above.	20 cans, the same as above.	2 cans, roller bandages.
Takeshiki Sick Quarters.	20 cans, the same as above.	—	50 roller bandages, 5 pieces of triangular bandages.

To those who lost their eyes or had their arms or legs cut off in the pre-

sent war H. M. the Empress made Her Gracious Gift of artificial eyes, arms and legs since the 28th of March, 1904.

The following will show how many of the patients at hospitals were favoured with the Imperial Gift:—

	Sasebo			Kure			Yokosuka			Maidzuru			Takeshiki			Total
	Artificial			Artificial			Artificial			Artificial			Artificial			
	Eye	Arm	Leg	Eye	Arm	Leg	Eye	Arm	Leg	Eye	Arm	Leg	Eye	Arm	Leg	
Officers and Warrant Officers	1	—	—	1	2	—	—	1	—	—	—	—	—	—	—	5
Petty Officers.	1	2	—	1	1	—	—	1	3	—	—	1	—	—	—	10
Blue jackets ...	3	3	2	—	5	4	1	10	13	—	2	4	—	—	1	48
Workmen	2	1	1	7	4	2	2	—	—	1	—	1	—	—	—	21
Boatmen.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Coolies hired by Government	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—	2
Prisoner Officers.....	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Prisoner Blue-jackets	1	—	—	—	—	—	—	—	—	1	—	1	—	—	—	3
Aggregates	8	6	4	9	12	6	3	13	16	3	2	7	—	—	2	91

In the Sasebo Naval Hospital visitors were very numerous both public and private. These persons came to inquire after the health of the patients at the time of the war—especially after the admission of the wounded at the battles of the Yellow Sea, off Ulsan, and of the Japan Sea, when high officials of Government and representatives of public and private corporations as well as individuals, came one after another in almost endless succession. There were also many who expressed their sympathy by sending words of consolation or letters of thanks. When H. Togo, Commander-in-Chief of the Combined Squadron, personally visit-

ed and inquired after the health of Rojestvensky, Commander-in-Chief of the Russian Second Pacific Squadron who was then confined to his sick-bed in No. 1 ward upstairs, the two admirals shook hands and exchanged many kindly wishes. There were, indeed, many friendly visitors of the sick, both government and private to each of the Hospitals of Kure, Yokosuka, and Maizuru, as also to the Sick Quarters of the Takeshiki Secondary Naval Station. Of these, Kure heads the list with as many as 1,262 visitors.

The following is the list of contributions made by the benevolent public :—

Article Contributed.	Sasebo Naval Hospital.	Kure Naval Hospital.	Yokosuka Naval Hospital.	Maizuru Naval Hospital.	Takeshiki Sick Quarters.	Port Arthur Naval Hospital.	Total.
Money <i>Yen</i>	3,100.305	2,169.105	121.000	593.737	—	—	5,984.147
Operating table No.	—	—	1	—	—	—	1
Iodoform Gramme	1.125	—	—	—	—	—	1.125
Carbolic acid Do.	450	—	—	—	—	—	450
Safety pins No.	200	—	—	—	—	—	200
Sublimated gauze ... <i>Tan</i>	300	—	—	—	—	—	300
T shaped belts No.	840	—	—	—	—	—	850
Bleaching powder ... Bags	100	—	—	—	—	—	100
Euguform Gramme	1.500	1.000	1.000	750	—	—	4,250
Dentist's free tickets (free of charge) ... No.	—	50	—	—	—	—	50
Citron Box	1	—	—	—	—	—	1
Charpie <i>Momme</i>	400	—	—	—	—	—	400
Diastase Bottles	200	—	—	—	25	—	225
Diastase Box	1	—	—	—	—	—	1
Patent medicines ... No.	14.850	—	—	—	—	—	14.850
Cotton <i>Tan</i>	3,515	428	—	—	75	45	4,063
Bandage Rolls	51.914	6.778	6.640	3.750	3.100	1.900	74.082
Triangular Bandages Sheet	1.125	—	—	—	—	—	1.125
Absorbent cotton gauze..... <i>Tan</i>	725	35	150	—	—	—	910
Absorbent cotton wool <i>Momme</i>	3.950	—	—	—	—	—	3.950

Surgical needles for war time Dozen.	2	2	—	—	—	4	8
Needle grinder No.	2	2	—	—	—	2	6
Injection syringes ... No.	2	—	—	—	—	—	2
<i>Sake</i> Go.	—	14	—	—	—	—	14
Wine..... Bottles.	180	170	72	144	—	—	566
Wine Dozen.	13	—	—	—	—	—	13
<i>Hirano</i> water Bottles	—	96	—	224	—	—	320
Milk Can.	184	—	—	—	—	—	184
Lump sugar ... Box.	—	1	—	—	—	—	1
Biscuits Can.	7	44	—	—	—	—	51
Brandy Dozen.	2	2	4	2	2	—	12
Handkerchiefs Pieces.	120	—	—	4,181	633	30	4,964
Soap Box.	300	300	—	—	—	—	600
<i>Tenugui</i> (Japanese Handkerchief) ... Pieces.	546	2,332	5,079	—	—	—	7,957
Picture Post-cards ... Do.	477	4,015	1,860	—	—	—	6,352
Candlesticks..... No.	10	—	—	—	—	—	10
Brass eans No.	10	—	—	—	—	—	10
Cholera belts for Summer wear Pieces.	1,000	—	—	—	—	—	1,000
<i>Go-ban</i> (chess board) Sets.	—	12	6	—	—	—	18
<i>Shogi-tan</i> (a kind of chess board.) Sets.	2	21	7	—	1	10	41
Pins No.	—	—	400	—	—	—	400
White Pins..... No.	2,400	—	—	—	—	2,400	4,800
Exercise caps No.	1,400	720	1,650	520	—	—	4,290
Cakes No.	3,876	162	—	—	—	—	4,038
Same in bags No.	—	—	117	250	71	10	448
Potato powder <i>Momme</i> .	2,600	—	—	—	—	—	2,600
Cocoa Cans.	145	160	—	—	—	—	305
Butter Cans.	—	4	—	—	—	—	4
Black tea..... Box.	—	1	—	—	—	—	1
Lemonade..... Bottles.	1,200	—	—	—	—	—	1,200
<i>Asahi-Miso</i> (bean- paste) <i>Kan</i> .	—	50	—	—	—	—	50

Article Contributed	Sasebo Naval Hospital	Kure Naval Hospital	Yokosuka Naval Hospital	Maidzuru Naval Hospital	Take- shiki Sick Quarters	Port Arthur Naval Hospital	Total.
Fruits No.	10,556	250	190	206	—	—	11,202
Oranges..... Baskets.	—	3	—	—	—	—	3
Fishes No.	31	—	—	191	—	—	222
Tortoise No.	—	—	—	22	—	—	22
Eggs No.	9,280	300	315	200	—	—	10,095
Condensed milk Cans.	50	—	—	—	—	—	50
Raisins Box.	1	—	—	—	—	—	1
Beer Doz.	8	—	—	—	—	—	8
Yoro soy Doz.	—	1	—	—	—	—	1
Canned food No.	92	—	—	—	—	—	92
Canned tobacco No.	—	8	—	—	—	—	8
Fine-cut tobacco paper wrapt No.	—	68	—	—	—	—	68
Cigarettes..... No.	6,673	3,791	58,375	1,707	100	96	70,742
Hanshi (paper) Quires.	4,954	1,100	438	50	—	20	6,562
Chirigami (paper) ... Quires.	—	1,000	—	—	1,000	2,000	4,000
Shirts & Drawers ... No.	117	—	—	—	—	—	117
Belts (<i>haramaki</i>)..... Piecc.	—	1	—	—	—	—	1
Hankerchief & <i>tenugui</i> Do.	8,407	—	—	—	—	—	8,407
White shirts No.	—	50	—	—	—	—	50
Gloves Pairs.	—	3	—	2	—	—	5
Pocket books No.	—	—	28	—	—	—	28
Small books..... No.	—	—	676	100	—	—	776
Card-holders..... No.	—	—	58	—	—	—	58
Field-post-cards Pieces.	—	500	—	—	—	—	500
Post-cards Pieces.	2,849	5,295	1,206	4,742	—	600	14,692
Soap No.	157	—	1,021	—	—	—	1,178
Stationary Packs.	27	—	—	—	—	—	27
Cigarette cases No.	—	2	—	—	—	—	2
Rolled note-paper envelopes No.	2,643	—	—	—	—	—	2,643
Envelopes Packages.	—	430	85	400	40	15	970

Gauze <i>Tan</i>	7	—	—	—	—	—	7
Rolled note papers ...Rolls	—	—	85	180	140	—	405
Note paper.....Sheets	—	—	—	—	—	250	250
Dentifrice & tooth- brushes .....No.	12	—	150	204	—	—	366
Tablets.....No.	1	1	—	—	—	—	2
Photo-holders .....No.	—	7	—	—	—	—	7
Amulets .....Packs	1	1,010	20	—	—	—	1,031
Rattan chairs .....No.	—	18	12	—	6	—	36
Pictures .....Book	—	—	—	—	—	16	16
Chairs & seats .....No.	—	—	—	12	—	—	12
Easy chairs.....No.	27	—	—	—	—	—	27
Artificial flowers .....Basket	—	4	—	2	—	—	6
Flower vases .....No.	3	52	—	3	—	—	58
Set flowers .....No.	—	56	—	—	—	—	56
Pupil's works.....No.	111	—	67	—	—	—	178
Phonographs .....Set.	6	3	2	2	1	—	14
Records .....Pieces	73	—	36	48	—	—	157
Paper organ .....No.	1	1	—	—	—	—	2
Music slips .....Pieces	30	13	—	—	—	—	43
Hand-organ.....No.	1	—	—	—	—	—	1
Magic lanterns .....Set.	—	—	1	—	—	—	1
Playthings .....No.	—	—	—	61	—	—	61
Fans.....No.	2,500	4,793	797	230	210	—	8,530
Bouquets .....No.	—	—	6	—	—	—	6
Flower baskets .....No.	5	—	5	—	—	—	10
Gold fish in glass vessels .....No.	—	9	—	—	—	—	9
Photo-albums Book	2	—	—	—	—	—	2
Photos of fine scenery, Sheets	—	50	—	—	—	—	50
Roller bandages.....Rolls	280	—	—	—	—	—	280
Trees No.	—	—	—	1,398	—	—	1,398
Dwarf plants .....No.	204	250	6	—	—	—	460
Cotton <i>Tan</i>	21	—	120	135	—	—	276

Article Contributed.	Sasebo Naval Hospital	Kure Naval Hospital	Yokosuka Naval Hospital	Maidzuru Naval Hospital	Take-shiki Sick Quarters	Port Arthur Naval Hospital	Total.
Surprise bags .....No.	386	370	130	1,157	468	—	2,511
Crutches .....Pairs	3	—	5	5	—	—	13
Bows .....No.	2	—	—	—	—	—	2
Arrows, 4-feathered ...Sets	—	1	—	—	—	—	1
Arrows, common .....No.	—	4	—	—	—	—	4
Hut for archery	—	1	—	—	—	—	1
Books .....Volumes	889	—	218	—	72	224	1,403
Newspapers & magazines	3,850	12,975	1,782	3,168	—	60	21,835
Garden laid out.....	—	—	—	2	—	—	2

SECTION II. SASEBO NAVAL HOSPITAL.

I. Preparation for the Reception of Patients.

1. Wards Proper and Special.

The Sasebo Naval Hospital had already played an important part during the war of 1894-5; and this time, too, standing at the base of operations it was ever ready to receive the wounded and sick sent back from the front.

It contains the following accommodations:—

4 ordinary ward pavilions, 1 infectious pavilion, 1 lunatic ward, 1 provisional ward (which was completed in March, 1896), together making seven buildings; the number of beds is fixed at an aggregate of 198, which, however, can be increased to 297 in cases of necessity.

The number of beds and the capacity of the sick rooms are as follows:—

Pavilions	Wards & Rooms.	Ordinary No. of Beds.	Maximum No. of Beds.	Cubic space (Shaku).	Cubic Space (Shaku)	
					Per Bed with Ordinary No.	Per Bed with Maximum No.
Pav. No. 1, first story.	Ward	24	34	30,581.88	1,274.25	899.47
	Small ward No. 1.	2	3	3,069.36	1,534.68	1,023.12
	X-ray room	—	—	—	—	—

Pav. No. I, 2nd story.	Dressing room	—	—	—	—	—
	Ward	24	34	30,581.88	1,274.25	899.47
	Small ward					
	No. 1	2	2	3,069.36	1,534.68	—
	„ No. 2	2	3	3,069.36	1,534.68	1,023.12
Total and Average.	„ No. 3	2	3	3,069.36	1,534.68	1,023.12
		56	79	73,441.20	—	—
		—	—	—	1,311.45	929.64
Pavilion No. 2.	Ward	20	29	24,324.86	1,216.24	838.79
	Small ward					
	No. 1	1	2	2,221.28	2,221.28	1,110.64
	„ No. 2	1	2	2,221.28	2,221.28	1,110.64
	„ No. 3	1	2	2,221.28	2,221.28	1,110.64
	„ No. 4	1	2	2,221.28	2,221.28	1,110.64
Total and Average.		24	37	33,209.98	—	—
		—	—	—	1,383.75	897.57
Pavilion No. 3.	Ward	28	40	37,656.36	1,344.87	941.41
	Small ward					
	No. 1	—	—	—	—	—
	(Dressing room)					
	„ No. 2	2	4	3,936.80	1,968.40	984.20
	„ No. 3	2	4	3,936.80	1,968.40	984.20
Total and Average.	„ No. 4	2	4	3,936.80	1,968.40	984.20
		34	42	49,466.76	—	—
		—	—	—	1,454.90	951.28
Pavilion No. 4.	Ward	32	50	43,071.00	1,345.97	861.42
	Small ward					
	No. 1	1	2	2,299.92	2,299.92	1,149.96
	„ No. 2	2	4	3,421.04	1,710.52	855.26
	„ No. 3	2	4	3,421.04	1,710.52	855.26
Total and Average.		37	60	52,213.00	—	—
		—	—	—	1,411.16	870.22

Pavilions	Wards & Rooms.	Ordinary No. of Beds.	Maximum No. of Beds.	Cubic space (<i>Shaku</i>)	Cubic space (<i>Shaku</i>)	
					Per Bed with Ordinary No.	Per Bed with Maximum No.
Infectious pavilion No. 1.	Ward No. 1	2	3	3,724.00	1,862.00	1,241.33
	„ No. 2	2	3	3,724.00	1,862.00	1,241.33
	„ No. 3	4	6	6,664.00	1,666.00	1,110.67
	„ No. 4	4	6	6,664.00	1,666.00	1,110.67
Total and Average.		12	18	20,776.00	—	—
		—	—	—	1,731.33	1,154.22
Insane Pavilion.	Room No. 1	1	—	1,233.96	1,233.96	—
	„ No. 2	1	—	1,233.96	1,233.96	—
	„ No. 3	1	—	1,084.98	1,084.98	—
		3	—	3,552.90	—	—
Total and Average.		—	—	—	1,184.30	—
Temporary pavilion No. 1.	Ward No. 1	2	4	3,290.84	1,645.42	822.71
	„ No. 2	2	4	3,290.84	1,645.42	822.71
	„ No. 3	2	4	3,290.84	1,645.42	822.71
	„ No. 4	2	4	3,290.84	1,645.42	822.71
	„ No. 5	6	8	5,725.39	954.23	715.67
	„ No. 6	6	8	5,725.39	954.23	715.67
	„ No. 7	6	8	5,725.39	954.23	715.67
	„ No. 8	6	8	5,725.39	954.23	715.67
		32	48	36,064.92	—	—
Total and Average.		—	—	—	1,127.03	751.35
General Total and Average.		198	297	268,724.76	—	—
		—	—	—	1,357.20	904.80

Remarks:—The maximum number of beds above shown is, however, in many ways restricted, so that a reduction by 27 was found inevitable, in spite of the spacious capacity of wards. The actual number of beds when increased to the maximum, therefore, counts only 270 in all.

Opening of Special Wards.—As stated in Section I of this Chapter, the regular wards of this hospital being already filled with patients, prior to the outbreak of the war, the barracks of the Torpedo Division were opened as special sick rooms on the 7th of September 1903.

The number of beds and the capacities of the rooms were as under :—

	Wards	No. of Beds.	Cubic Space.	Cubic Space per
			(<i>Shaku</i>)	Bed (<i>Shoku</i>)
Temporary Ward Barracks in Torpedo Division.	Ward No. 1. first story.	54	40,032.40	741.34
	Ward No. 2. first story.	46	32,640.30	709.57
	Ward No. 1. second story.	12	10,035.57	836.30
	Ward No. 2. „ story.	12	10,035.57	836.30
	Ward No. 3. „ story.	30	20,888.00	696.27
	Ward No. 4. „ story.	6	5,117.00	852.83
	Ward No. 5. „ story.	36	22,764.00	632.33
Total and Average...		196	141,512.84	722.00

Remark :—The barracks had been opened for 2 years and 36 days, when it was closed on October 11th 1905.

2. Establishment of Provisional Wards.

The proper wards being already full as above stated and the opening of the special wards proving insufficient to meet the demand, it became necessary to provide fresh provisional accommodation. With the sanction obtained on March 6, a piece of open ground of about 4,000 *tsubo* lying to the east and to the north west of the hospital, was added to the hospital compound, thus increasing the site of the hospital to 15,219.28 *tsubo** in extent; and then the new building was started.

The provisional sick rooms in the three newly constructed buildings were

*1 *Tsubo*=36 square *Shaku*.

designated as provisional pavilions No. 2, 3, and 4 respectively. No. 2 was finished towards the end of March, No. 3 in the middle of April, and No. 4 at the end of May.

Nos. 2 and 3 are semi-permanent one storied buildings, each of 140 *tsubo*, with "Malthoid Roofing." The connecting passage covers an area of 32.5 *tsubo*. These two pavilions are alike in structure, and each contains one large chamber, with five small rooms in No. 2 and six in No. 3. Each has nurses' waiting room, room for serving food, smoking room, lavatories and water-closets; while the number of beds is 34 (24 in the larger and ten in the smaller ward) in No. 2 and 36 (24 in the larger and 12 in the smaller room) in No. 3. These numbers, however, could be increased in cases of emergency, to 49 (34 in the larger and 15 in the smaller) in No. 2, and 52 (34 in the larger and 18 in the smaller) in No. 3. Pavilion No. 4, a single-storied building with "Malthoid Roofing" and covering an area of 120 *tsubo*, is very rudely constructed, having no ceiling and standing on piles driven into the ground. With 6 *tsubo* for water-closets and bathrooms and 1 for a passage, it contains 2 large wards, nurses' waiting rooms, and room for serving food, the beds numbering 42 with 16 in reserve.

The total are covered by the above three pavilions is 440 *tsubo*, the fixed number of beds 106 with 47 reserved. The capacity of each sick-room is as shown below :—

Pavilions	Wards	No. of Beds (in ordinary condition)	Maximum No. of Beds	Cubic Space (<i>Shaku</i>)	Cubic Space. (<i>Shaku</i>)	
					Per Bed with Ordinary No.	Per Bed with Max. No.
Temporary Pa- vilion No. 2.	Large Ward	24	34	18,947	789	557
	Small Ward No. 1.	2	3	2,362	1,181	787
	„ No. 2.	2	3	2,362	1,181	787
	„ No. 3.	2	3	2,362	1,181	787
	„ No. 4.	2	3	2,362	1,181	787
	„ No. 5.	2	3	2,362	1,181	787

Total and Average		34	49	30,757	905	628
Temporary Pa- vilion No. 3.	Large Ward	24	34	18,947	789	557
	Small Ward No. 1.	2	3	2,362	1,181	787
	„ No. 2.	2	3	2,362	1,181	787
	„ No. 3.	2	3	2,362	1,181	787
	„ No. 4.	2	3	2,362	1,181	787
	„ No. 5.	2	3	2,362	1,181	787
	„ No. 6.	2	3	2,362	1,181	787
Total and Average		36	52	33,119	920	637
Temporary Pa- vilion No. 4.	Ward No. 1.	24	34	17,928	747	527
	„ No. 2.	18	24	13,415	745	559
Total and Average		42	58	31,343	746	540
General Total						
„	Average.	112	159	95,219	850	599

The second provisional pavilion was opened on the 15th of April, 1904; the Third on the 19th of May; and the Fourth on the 15th of August; and they continued open until the restoration of peace.

3. Establishment of Operation-Room No. 2, Bacteriological and Pathological Laboratory and Disinfection-Room attached; Removal and Extension of Laundry.

Operation-Room No. 2. was put in hand on February 19, 1904, close to operation-room No. 1; and was connected with the latter by a passage already in existence. It covers an area of 13 *tsubo*, the floor being entirely of concrete. With the exception of the passage, the whole is well lighted with lofty glass windows on the three sides, and a skylight at the top.

This was originally designed as a reserve room in which patients could be prepared for operations, but, with the intention of using it also for the treatment of purulent wounds, it was stocked and fitted with sterilizers both for water and materials for dressing and one for surgical instruments. This room was finished on the 14th of May, 1904.

Bacteriological and Pathological Laboratory.—This is a permanent building one story high, made of wood and covering 20 *tsubo*. It stands between the second and third proper ward-pavilions. The floor is entirely in concrete facing. The room is well lighted by a large window. It is divided into compartments by wooden partitions—thus providing, bacteriological and chemical laboratories, a room for incubation etc.

The bacteriological laboratory has fixed under the window an examination table with a number of small cupboard and pigeonholes below. It was put in hand on March 7 and finished on May 5, 1904.

The disinfection building attached to the hospital was begun on March 7, and finished on May 5, 1904. It is one storied building of 20 *tsubo* and stands at the foot of the hill at the back of the grounds. The estimate cost allowed for this building rendered it necessary to erect nothing but a rude and temporary structure. The interior is divided into infected and non-infected compartments, and a boiler room.

The disinfector was built in the Sasebo Navy Yard and is extremely strong, being on the double-barreled system, and is so constructed that the air in the inner barrel is driven out by steam ejectors and the heated air injected in such a way that the desiccation of objects subjected to disinfection is accelerated. The highest pressure test showed that the boiler could be worked with 30 lbs. of steam and 60 lbs. of water.

Extension of Laundry.—The original laundry being only 28.5 *tsubo* in extent, and therefore inadequate to meet the pressing demands made during war-time, was removed to the back part of the kitchen; and at the same time extended by the addition of 20 *tsubo* of space. A Nelson and Kreuter Washer was at the same time introduced. The interior is divided into a sewing room, boiler room, and a store room. The present extension was begun on March 7 and finished on

May 5, 1904. The highest attested pressure of the laundry-boiler is 60 lbs. of steam and 120 lbs. of water.

4. Establishment of Infectious Pavilion No. 2.

The original infectious ward pavilion No. 1 being too small, being provided with only 12 beds and 6 in reserve, sanction was obtained towards the end of 1904 for building a new one. It was started on November 28, 1904 and finished on January 30 of the next year. The new room was opened on April 30. This is a single-storied wooden building, semi-permanent in structure, with "Malthoid Roofing," covering an area of 120 *tsubo*—the floor being laid with asphalt. It comprises a larger, a middle, and smaller wards, with nurses' waiting room, serving room for food, bath, and water-closet.

The number of beds and capacity of rooms and wards are as under:—

	Wards and Rooms.	Ordinary No. of Beds.	Maxim. No. of Beds.	Cubic Space (Shaku)	Cub. Space (Shaku)	
					Per Beds with Ordinary No.	Per Beds with Maxim. No.
Infectious Pavilion No. 2.	Large wards	18	24	24,677	1,371	1,028
	Small wards	5	7	7,007	1,401	1,001
	Room No. 1.	1	1	2,093	2,093	—
	Room No. 2.	1	1	2,093	2,093	—
	Room No. 3.	1	1	2,093	2,093	—
Total and Average		26	34	37,963	1,460	1,117

5. The New Pavilions and Bathroom.

The newly built pavilions are two, both of which are two storied houses each covering an area of 140 *tsubo*. The work was commenced on October 14, 1904, and completed on January 15, 1906, after the restoration of peace. The fixed

numbers of beds in pavilion No. 1 are 24 in the larger, and 3 in the smaller ward downstairs, and 34 in the larger and 5 in the smaller ward upstairs, while in the other pavilion there are 24 in the larger and 3 in the smaller ward downstairs with 24 in the larger and 5 in the smaller ward upstairs. This difference in the number of beds in the smaller rooms is due to the fact that in the one pavilion two of the smaller rooms are appropriated to an electro-therapeutic and a hydro-therapeutic room respectively; while in the other pavilion one of the smaller rooms has been made into a dressing room.

The bathroom for common use was put in hand on October 14, 1904 and completed in June of the following year. It covers an area of 12 *tsubo*, having a bathing place of 1.37 *tsubo* in brick with hot and cold water reservoirs. Steam is conducted into the bath and hot water reservoir through pipes with siphons. The floor and lower parts of the wall are covered with white porcelain tiles.

6. Equipments of the Wards, Operating Rooms etc.

Electric Lights.—From February 24, 1904, administration-building, wards and operating rooms were provided with electric lights—19 in the administration-building, 7 in the operating room, 16 in ward No. 1, 9 in No. 3, 7 in No. 4, together making a total of 58. But with the completion of the provisional wards the above number was increased by the addition of 59 more.

Electric Current to X-rayApparatus.—This was originally drawn from a storage battery; but on October 10, 1904 was made to act through the working of laundry-engine, a dynamo being at that date set up in the laundry. This engine came into sole use after February 1905.

Telephone. Telephonic communication was opened between the administration-building of the hospital and several other offices of the Naval Station; it was found impossible to have it established between pavilions and wards.

Steam-Pipes.—Before the war there was but one small boiler, from which steam was drawn into the operating room for purposes of heating; but a larger boiler was placed in the laundry in February, 1905; from which time steam was conducted into the disinfection building, the bathroom, operating rooms Nos. 1 and 2, the pharmacy, the chemical and pathological laboratories, etc.

A steam decoctor, a milk sterilizer, a water-distillator, desiccators, etc. are provided in the laboratory attached to the pharmacy.

II. Establishment of a Recreation Ground and Amusement Hall.

To the north-west of the hospital, there is an elevated piece of ground of irregular formation and rising gradually towards the outside of the hospital compound. It would have been admirably adapted for a recreation ground for convalescents, had it not been for the fact that the part facing the hospital was too precipitous to climb and was thickly overgrown with weeds and brambles. The whole, consequently, remained a useless waste. At the time, however, that the compound was extended, this piece of ground was enclosed within the compound and a path made (11th of June, 1904) by clearing away the undergrowth. A large number of trees and bushes, cherry, plum, peach, maple, azalea, cedar, pine and other plants and flowers, was planted; an arbor was erected on the knoll, and eight benches placed about in suitable places.

It was thus converted into a good recreation-ground. The arbor and benches were contributions from an American, Doctor Mitchell, and seven other gentlemen.

The top of this place commands an exquisite view of "water light and mountain colour"—"a fine scene whether in rain or shine."

By similar contributions, also, from the agents of three companies, the Yusen, Shosen, and Mitsui Bussan, an amusement hall was erected, which was finished on October 8, 1905. This added a great deal to the attraction of the place.

This hall is a single-storied, tile-roofed wooden building of 35 *tsubo*, containing two rooms each of 18 mats* (*tatami*). The floor of one of the rooms is covered with linoleum, in the middle of which stands a large table with six sofas around it. The three sides of the room open on to verandahs that almost surround it, and there are glass windows besides, which all make it a most comfortable little house. The interior is provided with various games and books for amusement, such as, *go* and *shogi* boards; bows and arrows, parlour-rifles, a grand piano, paper-organ, graphophone, newspapers, magazines, novels, miscellaneous books for amusement, etc.

* A mat=18 square feet, that is half a *tsubo*.

III. Supply of Medical Articles.

The preparation and supply of medical stores were under the control of managers of the Medical Depôt belonging to the Naval Hospitals. The gathering of the Standing Squadrons at the Port of Sasebo in August, 1903, naturally caused numerous other vessels to visit the port, and a sudden strain was in consequence thrown upon the Medical Depôt of the Sasebo Naval Hospital. Later on, after the war had actually commenced, the men connected with the store were even more pressed by business, as they had to supply a large number of vessels in the front with suitable quantities of medical stores. The stores and their quantities supplied to those vessels were roughly speaking as follows :—

The war-vessels for the front :—

(A) The war-ships *Mikasa* and 22 other vessels (*Shikishima, Asahi, Iwate, Chitose, Yakumo, Chihaya, Yoshino, Suma, Oshima, Tatsuta, Katsuragi, Hatsuse, Idzumo, Tokiwa, Adzuma, Kasagi, Miyako, Banjo, Akashi, Chokai, Kaimon*, and *Uji*) were each supplied in addition to the quantity of medicines and consumable medical articles previously stored in them, with an extra quantity amounting to one-third of the yearly amount fixed in the regulations relating to expenditures and supply, and besides, they obtained an extra supply of the following articles in the quantities fixed for a year.

1. Medicines :—Carbolic acid, chloroform, iodoform, corrosive sublimate with common salt, brandy, alcohol, pierie acid, hydrochlorate of cocaine, hydrochlorate of quinine, rubber plaster, and alcohol with Methyl alcohol (1 : 10).

2. Consumable Medical Articles :—Flexible wooden splints (large and small), felt, cotton cloths, lint, cotton wools, absorbent cotton wools, absorbent gauze, first-aid packages, paraffin paper, silk threads, triangular bandages, pins, ice-caps, oil paper, rubber tubes, soap and nail brushes.

(B) In accordance with the agreement arrived at among the chief surgeons of the ships belonging to the Combined Fleet, the following quantities of medical articles (as mentioned below) were supplied to each vessel as extra quantities or extra articles not embraced in the Supply Regulations.

PLAN OF SASEBO NAVAL HOSPITAL.

The part from the red dotted line upward shows that part of the hospital compound extended during the war.

1. Administration building.
2. Pavilion wards Nos. 1, 2, 3, 4, and ward barracks.
3. Temporary pavilion wards Nos. 1, 2, 3, and 4.
4. Infectious wards, Nos. 1 and 2.
5. Insane ward.
6. Pathological and bacteriological laboratory.
7. Operating rooms Nos. 1 and 2.
8. Storehouse for drugs.
9. Medical storehouse.
10. Storehouse.
11. S.B. attendant's quarters.
12. Sterilizing room for dressing materials.
13. Lavatory.
14. Kitchen.
15. Storehouse.
16. Temporary kitchen.
17. Baths.
18. Laundry.
19. Disinfecting plant.
20. Garbage burner.
21. Storehouse.
22. Dead house.
23. Closets.
24. Coolies' house.
25. Gate keepers.
26. Storeroom for drugs.





1. Fixed Articles :—Chloroform inhaler, half the full number of operation gowns fixed for each ship, a Mackintosh sheet, and an India rubber pillow.

2. Consumable Materials :—Six *shaku* of rubber tubes (for tourniquets).

3. Medicines :—One year's amount of vaseline and 450 grammes of ether. (The above shows quantities supplied to a vessel and the same holds good for all the following cases).

(C) Articles designed by Dr. Totsuka, Director of the Sasebo Naval Hospital, which were recognised to be of special need in time of war, and accordingly supplied to each ship, as follows :—

1. Fixed Articles :—One set or more of Totsuka's stretcher.

2. Consumable Articles :—Zinc splints, large, medium and small, six of each.

(D) Medical articles supplied according to the instruction of the Medical Bureau of the Navy Department to each vessel as extra quantities or as extra articles not specified in the Supply Regulations as follows :—

1. Fixed Articles :—A pair of Michel forceps, and scissors for miscellaneous use.

2. Consumable Articles :—50 pieces, wound clamps.

Complementary supplies given out until December of the year 1905 was as follows :—

Kinds of Supplies	Number of Vessels	Name of Vessels
Supplies of fixed amount.	7 vessels	<i>Suwo, Takao, Tango, Soya, Katsuragi, Tsugaru, and Sagami.</i>
Supplies of fixed amount and extra amount not specified in the Regulations.	8 vessels	<i>Banjo, Matsushima, Chinyen, Fuso, Tsushima, Hashidate, Kongo, and Maya.</i>
Supplies of fixed amount and extra articles not specified in the Regulations.	2 vessels	<i>Iki and Chokai.</i>
Supplies of extra amount not specified in the Regulations.	4 vessels	<i>Adzuma, Akashi, Nitaka, and Tsukushi.</i>
Supplies of extra amount and extra articles not specified in the Regulations.	5 vessels	<i>Yakumo, Kasuga, Nisshin, Itsukushima, and Yuyeyama.</i>

Kinds of Supplies	Number of Vessels	Name of Vessels
Supplies of fixed amount, extra amount, and extra articles not specified in the Regulations	22 vessels	<i>Shikishima, Iwate, Idzumo, Kasagi, Akitsushima, Suma, Mishima, Okinoshima, Tokiwa, Chiyoda, Naniwa, Asahi, Takachiho, Uji, Hiyei, Chihaya, Chitose, Mikasa, Otowa, Fuji, Asama, and Tatsuta.</i>
Total	48 vessels	

Destroyers :—(A) The destroyer *Kasumi* and 18 others (*Akatsuki, Usugumo, Kagero, Shiranui, Yugiri, Murakumo, Shinonome, Ikadzuchi, Inadzuma, Akebono, Sasanami, Oboro, Hayatori, Asashio, Shirakumo, Murasame, Harusame, and Asakiri*) were supplied, in addition to the yearly amount of medicines and consumable articles fixed in the Regulations, with three times as much of the fixed annual quantities of the following consumable articles, and also with the following medicines as extra articles not prescribed in the Regulations.

1. Consumable Articles :—Flexible wooden splints (large, medium and small), cotton cloths, roller bandages of cotton cloth, absorbent cotton wools, roller bandages of gauze, silk threads, oiled paper, absorbent gauze, first-aid packages, paraffin paper, triangular bandages, and pins.

2. Medicines :—Brandy, 500 grammes ; sesame oil, 900 grammes ; glycerin, 450 grammes ; alcohol, 450 grammes.

(B) In accordance with the agreement concluded among the surgeons on board the destroyers, the following quantities of medical articles were supplied to each vessel as extra quantities or as extra articles not specified in the Supply Regulations.

1. Fixed Articles :—Two operating gowns and a Mackintosh sheet.
2. Consumable Article :—Six *shaku* of rubber tube (for arresting bleeding).
3. Medicines :—One year's amount of vaseline and 450 grammes of ether.

(C) Articles designed by Dr. Totsuka of the Sasebo Naval Hospital, which were recognised to be of special need in time of war, and were accordingly supplied to each ship, as follows :—

1. Permanent Articles :—A Totsuka stretcher and a tin box for dressing materials.

2. Consumable Articles :—Zinc splints (large, medium and small, each six in number).

(D) Medical articles supplied according to the instruction of the Medical Bureau of the Navy Department to each vessel, as extra articles not specified in the Supply Regulations, were as follows :—

1. Fixed Permanent Articles :—A pair of Michel forceps.

2. Consumable Articles :— 50 pieces, wound clamps.

(E) Besides the above-mentioned, the articles which were deemed as requisites in war time and supplied, were as follows :—

Permanent Instruments :—Two disinfection basins, a pair of shears for miscellaneous use, a tape measure, and a glass bobbin.

The following were also provided for vessels as complementary supplies until the end of December of the year 1905.

Kind of Supplies	Number of Vessels	Name of Vessels
Supplies of fixed amount	6 vessels	<i>Usugumo, Asagiri</i> , and 11th Destroyer flotilla.
Supplies of fixed amount and extra amount not specified in the Regulations.	4 vessels	<i>Shiranui, Yugiri, Kasumi</i> , and <i>Murakumo</i> .
Supplies of fixed amount and extra articles not specified in the Regulations.	2 vessels	<i>Sazanami</i> and <i>Yamahiko</i> .
Supplies of extra amount and extra articles not specified in the Regulations.	1 vessel	<i>Inadzuma</i> .
Supplies of extra articles not specified in the Regulations.	6 vessels	{ <i>Shinonome, Murakumo, Kagero, Akatsuki, Oboro</i> , and <i>Satsuki</i> .
Supplies of extra amount.	2 vessels	<i>Ikadzuchi</i> and <i>Akebono</i> .
Total	21 vessels	

The Converted War Vessels and Special Service Ships:—

1. The converted cruisers, *Nippon Maru*, *Hong-Kong Maru*, *Daichu Maru*, *Dainan Maru*, *Yōbu* and other special service ships *Nikko Maru*, *Kumano Maru*, *Miike Maru*, and *Yedo Maru* each supplied with the full amount of medical articles for vessels of their class, according to the Regulations and the following were supplied as complementary store until the end of December, 1905.

Kind of Supplies	Number of Vessels	Name of Vessels
Supplies of extra amount not specified in the Regulations.	2	{ <i>Dainan Maru</i> , and <i>Shinano Maru</i> .
Supplies of fixed amount and extra articles not specified in the Regulations.	5	{ <i>Daichu Maru</i> , <i>Nippon Maru</i> , <i>Hong-Kong Maru</i> , <i>Sado Maru</i> and <i>Yawata Maru</i> .
Supplies of fixed amount extra amount and extra articles not specified in the Regulations.	4	{ <i>Matsuye Maru</i> , <i>Keijo Maru</i> , <i>Tainan Maru</i> and <i>Heijo Maru</i> .
Total	11	

2. Each of the converted gun-boats was at first provided with medicine chest No. 4, and afterwards, when a surgeon was sent round to inspect the boats, he was ordered to take with him a number of large or middle-sized chests sufficient to supply each of the 12 boats with an additional chest.

3. Other special service vessels on which a surgeon was carried, were provided with medicine chests No. 1 and No. 3, a chataleine, a stretcher and several other articles deemed necessary. The *Niigata Maru* and five other vessels were provided with substitutes for medicine chests No. 1 and No. 3, with a chataleine and a stretcher, some other medical articles being supplied besides the above.

Vessels carrying no surgeon were each provided with the following surgical articles by way of substitutes for three No. 4 medical chests.

	Articles	Quantities
Permanent Articles	Clinical thermometer No.	1
Consumable Articles	Roller bandages, cotton No.	15
	First-aid bandages No.	15
	Absorbent cotton wools <i>Momme</i>	150
	Square paper for medicines..... Sheet	300
Medicines	Acids boric and salicylic mixed Gramme	360
	Stomachic tabloids No.	600
	Rubber plaster <i>Shaku</i>	9
	Sodium salicylate, tabloids No.	90
	Dover's powder tabloids No.	90
	Carbolic acid solution (5 %) ... Gramme	1,350
	Calomel tabloids No.	60

4. The *Kobe Maru* and *Saikio Maru* were supplied with abundant quantities of medical articles.

5. In the Naval Heavy Gun Brigade the following articles have been supplied.

	Articles	Quantities
Permanent Articles	Medicine chest for landing party (A) No.	1
	Medicine chest for landing parties (B) No.	1
	Clinical thermometers No.	5
	Nurses' emergency bags No.	16
	Portable surgical bags..... No.	2
	Mackintosh sheets..... Sheet	1
	Chatelaines No.	20
	Glass bobbins No.	1
	Cork screws..... No.	1
	Operation gowns No.	10
	Portable operating case No.	2

	Articles	Quantities
	Brass basins No.	3
	Stretchers No.	16
	Hypodermic syringes No.	3
Consumable Articles	200 glass measure No.	1
	Flexible wooden splints (large) No.	20
	Flexible wooden splints (medium) ... No.	20
	Cotton cloth <i>Tan</i>	60
	Absorbent cotton wool <i>Momme</i>	500
	Absorbent gauze..... <i>Tan</i>	20
	Gauze packages No.	100
	First aid packages No.	2,000
	Triangular bandages..... Sheet	30
	Silk threads <i>Momme</i>	5
	Oiled paper Sheet	5
	Rubber tubes <i>Shaku</i>	6
	Brushes for applying external medicines No.	20
	Corks No.	20
	Soaps No.	20
	Towels Sheet	5
	Earthen bed pans No.	3
	Glass urinals No.	1
Medicines	Carbolic acid Gramme	9,000
	Chloroform Do.	325
	Rubber plaster <i>Shaku</i>	15
	Corrosive sublimate with salt ... Gramme	900
	Iodoform Do.	112
	Sodium bicarbonate..... Do.	1,800
	Bismuth subnitras Do.	450
	Magnesium sulphate Do.	900

Spirits	Gramme	1,350
Brandy	Do.	650
Spirit of camphor	Do.	450
Antipyrin	Do.	320
Cocaine tabloids	No.	200
Morphine tabloids	No.	200
Sodium salicylate tabloids	No.	2,000
Dover's powder tabloids.....	No.	360

6. To Staff Surgeon Harada, who was attached to the first, second, and third Squadrons, the following articles were specially supplied for the purposes of dental treatment.

	Articles	Quantities
Permanent Articles	Tooth instrument case No.	1
	Dental engine..... No.	1
	Sealing instruments..... No.	12
Consumable Articles	Liquor hydrogenii peroxidi..... Gramme	896
	Gutta percha	720
	Cement	90
Medicine	Concentrated quassia solution ... Gramme	28

Besides the above-mentioned, complementary medical articles and supplies of extra amounts or extra articles not specified in the Regulations have been made.

7. To Port Arthur Naval Hospital an amount estimated by a comparison with the fixed quantities in the Naval Hospital at home was supplied.

8. The Sick-Quarters of the Takeshiki Secondary Naval Station were provided with the following medical articles, besides those ordinary stored.

	Articles	Quantities
	Medicine chest No. 1 No.	1
	Medicine chest No. 2 No.	2

	Articles	Quantities
Permanent Articles	Medicine chest No. 3..... No.	1
	Nurses' emergency bags..... No.	5
	First-aid bags..... No.	9
	Irrigators No.	3
	Dressing trays No.	3
	Portable surgical bags No.	2
	Chatelaines No.	5
	Stretchers No.	17
	Brass basins No.	3

9. The Sick-Quarters of the Bako Secondary Naval Station were provided with the following medical articles besides those ordinarily stored.

Articles	Quantities
Medicine chest for landing parties (A) No.	1
Medicine chest for landing parties (B) No.	1
Nurses' emergency bag..... No.	1
First-aid bags No.	4
Chatelaines No.	2
Stretcher No.	1

Such is a summary of medical articles and their amounts supplied to the principal vessels and store establishments during the late war. As partial illustration of the amount of business concerning the supplies, a list of places, times, and articles supplied, in the period from February of the year 1904 to December of the year 1905 is given below :—

Number of places supplied..... 249.

Number of times supplied 4,795.

Number of articles supplied 30,733.

The classification of the number of times and articles supplied according to the headings of permanent instruments, consumable medical articles, and medicines is given here in a table with the extra amount and extra articles.

	Permanent Articles	Consumable Articles	Medicines	Total
Number of times supplied.....	1,560	1,335	1,900	4,795
Number of articles specified in Regulations	3,713	7,926	9,010	20,649
Number of extra amounts not specified in the Regu- lations	903	1,404	4,395	6,702
Number of extra articles not specified in the Regu- lations	748	462	2,172	3,382

IV. The Medical Staff and Assistants to the Relief Work.

1. The Regular Medical Staff.

The medical staff consisted of the following :—

Director { Surgeon General or Surgeon Inspector 1
 { Surgeon General K. Totsuka.

Assistant { Surgeon Inspector or Fleet Surgeon 1
Director }

Surgeon Inspector Y. Ota, on February 13th, 1904, re-
placed by Fleet Surgeons Kuwabara, who was promoted Sur-
geon Inspector on January 13th, 1905.

Fleet or Staff Surgeons 3

Surgeons 5

Chief Apothecaries or Apothecaries (one being an additional post)... 2

Manager of Medical Depôt Chief Apothecary, 2nd class, or
Apothecary 1

Apothecary in charge of Sanitary Examination Laboratory.....Chief
Apothecary 2nd class or Apothecary 1

Member of the above.....Chief Apothecary 2nd class or
Apothecary 1

Regular Nursing Force :—The Sasebo Naval Hospital had its regular nursing force of the fixed number of 65 with a head ward-master 1st class at the head. At the commencement of the war, however, a large number of nursing hands being required for distribution among the ships of the fleet and fleet auxiliaries, a great deficiency of nursing hands resulted. To meet the demand 28 nurses were hired on the 5th of February. Also, on March 7, an addition was allowed to the regular force of 34 regular nurses and one ship's cook. The nurses in the first and second reserves being extremely few, and many out of their number being moved as time went on to other quarters, the gaps in their ranks grew wider and wider until it was found necessary to fill them temporarily with hired help. Afterwards on May 16, 2 sick berth stewards and 5 sick berth attendants on the lists at Maidzuru Naval Station, and 4 sick berth Stewards and 13 sick berth attendants enlisted at Yokosuka Naval Station were obtained to fill up the vacancies. On September. 23, same year, occasion demanded an exchange of nurses with the hospital ship *Kobe Maru*; and 2 sick berth Stewards and 1 sick berth attendant on the list at Kure Naval Station having come to the hospital, it so turned out that the sick berth staff at that time on service were from all the four Naval Stations. And as it is necessary, in cases of supplementing the nursing force in the ships and naval organizations at the front, to select and send forth the most excellent in their art and the most diligent in service, especial care was taken at all times to keep pace with the constantly developing emergencies.

Soon afterwards, the arrival of two relief parties dispatched from the Red Cross Society added much to our convenience in working.

Employés.—There were no changes among the porters, though some occurred among the writers, without however increasing their number, unimportant inconveniences being met by selecting from the ranks of the warehousemen and hired nurses some one or two men who were sufficiently educated for the work.

Hired Assistance.—There was a general increase in the number of hired men of all kinds with the exception of warehousemen and instrument repairers—i.e., 2 servants developed into 7, 3 office-boys into 7, 1 coolie into 8, 8 cooks into 17, 6 laundrymen into 10, and 1 engine-man into 2. This notable increase in the number of servants, office-boys, coolies, and cooks was owing to the open-

ing of provisional wards and to the establishment of a Quarantine Station at Hyakkenbana. It was by no means proportionate to the increase in the number of patients.

2. Hired Sick Berth Attendants.

After February 6, 1904, when 27 nurses were engaged (one more being added the next day) and for the rest of the war, the patients were attended by hired nurses in the place of men belonging to the regular sick berth staff.

How the Nursing Staff are Hired.—The applicants for the service first send in their application with their curriculum vitae and a copy of their census register annexed. They have, then, to pass a physical examination, followed by a literary examination in reading, arithmetic, penmanship, etc.—the standard of attainments required being that of a higher elementary school. They are taken into service in the order of their proficiency as shown by the results obtained in the examination. Those of the applicants who have had any experience in the way of having acted as assistants to a doctor or a pharmacist or as nurses, are taken by preference, quite irrespective, except in cases of phenomenal ignorance, of their achievements in the examination. There was no lack of applicants; for, in response to the second appeal, i.e., at the end of March, 1904, the number asked for was 28, while the applicants exceeded 170 in number. The applicants must be fully 18 years of age and under 40 years.

Training.—A large majority of the hired nurses were utterly destitute of knowledge in the art of nursing; but as they were merely employed to fill in the gaps in the proper nursing force, no time was allowed for them to go through a regular course of training in their duties, but they were at once distributed, as soon as they were engaged, among the several sick rooms, where their training was given them by the bed-side by actual practice in nursing and dressing. For a period of 2 weeks or 1 month after engagement, one or two hours' lessons were given every day, and they were thus taught the first principles of the art of nursing and dressing wounds, the names of the outer parts of the body as well as the art of transporting the wounded.

Allowances.—A day's wage for a hired nurse was 60 *sen* to begin with.

But experience showed it to be rather unwise to give them the highest allowable wage from the very beginning, and it was deemed better to keep back a certain part of their wages for future addition, in such a way as to encourage them to diligence and long service. It was, therefore, decided, at the time of the second appeal, that the daily wages should be 50 *sen* to begin with, excepting in specially selected cases, and that at the end of a term of service (in May or December as the case might be) an addition should be made to their wages of from 1 *sen* to 5 according to their merits in the service. Their clothing was provided at their own expense; but as the wearing of a regular working rig while on duty was considered necessary, sanction was obtained on February 7 to let them have the regular attendants' working rigs on loan.

The board was the same as that for regular sick berth staff.

Discipline and Service.—The hired nurses were, as a rule, made to live in one of the barracks, but this being found too small for their accommodation, room was made at one time for a part of them to live in No. 1 temporary pavilion.

Their service, night-duty, food, etc. were the same as those for the regular nursing force, and leave of absence was given once per week.

Changes.—The hired nurses employed during the war time were 206 in number, and the number that remained in service at the end of the war was 37; only two remaining in the service all through the period of the war. This goes to show that there were incessant changes in the service. The cause of these changes was mainly that the discipline was too severe for them, as also that there was too much demand for their services in other quarters during the war time. For the prevention of such changes it was so arranged that those who were engaged on and after March, 1904, should make a promise not to leave the service within 6 months from engagement. This, however, proved comparatively of but little avail.

The largest number on active service was on the 1st of April, 1904, when their number reached 67. The aggregate number extending over the whole period was, 31,289, making 51 per day on an average.

3. The Red Cross Society's Relief Party.

On the 18th of April, 1904, the Vice-Admiral Yamamoto, Minister of the Navy, took measures to have a relief party composed of Red Cross Nurses belonging to the Society's Nagasaki Branch Relief Department despatched to the Sasebo Naval Hospital for relief work; and on the same day sent instructions to that effect to Vice-Admiral Sameshima, Commander-in-Chief of the Sasebo Naval Station. Subsequently on the 20th of the same month, the 17th Relief Party of the Nagasaki Relief Branch arrived at the hospital and took up work in the second temporary pavilion. Afterwards, on August 26 of the same year, another party was despatched, the 85th Relief Party of the Fukuoka Branch, which arrived on the 2nd of September.

These two relief parties remained in service until the restoration of peace, the 17th party returning to its own quarters on November 9, 1905, and the party on the 29th of the same month.

Each of these parties was composed according to the Provisions of Article 39 of the Red Cross Society's Regulation for Relief in Time of War, of 2 medical officers, 1 pharmacist, 1 clerk, and 2 head nurses with 20 nurses under them, making 26 persons in all. The Red Cross Medical Officers worked in the temporary pavilions, either one or two of them being placed in each pavilion according to the amount of service required, under the superintendence of the medical officer of the Navy.

The pharmacists attended to the preparation of medicine under the supervision of the naval apothecary.

The head nurses and nurses were generally well versed in their art and skilful, upright in conduct, attentive to discipline, and assiduous in duty. They were also very kind and gentle to the patients. One half of their number were married women, who had long left off the business of nursing, while the other half had been engaged from the University Hospitals at Kyoto and Fukuoka, or else from the prefectural hospital.

These nurses were at first distributed in the sick rooms under the charge of their own medical officers; but on and after August 15, 1904, one whole party or

a half of them were placed in pavilion No. 1. under the naval medical officer in charge and were set to attending the patients above the ranks of warrant officers and the severely wounded among the petty officers and seamen. And then, from October to December, 1904, while the hospital was full of dysentery cases, one half of the party was drafted off to the special duty of nursing these cases. The duties of their medical officers were at first to attend, one at a time, at the hospital office like the other officers of the hospital and to remain after office hours in their lodging to look after the whole party, while the other remained in charge of the sick-room till 9 p.m. This was their routine so long as there was only one party; but this was changed after the arrival of the 85th party, when it was so arranged that only one of the whole number of their medical officers was required to attend to night-duty in rotation. The pharmacists, too, were at first required to attend duty only in the day time; but after the arrival of the other party, they were made to keep a night-watch one at a time by turns.

The clerks acting under the direction of their medical officer attended to the business of the party.

The head nurses and nurses dividing themselves into two parts, each half of them (numbering 10), was made to attend to the care of one ward at one time. Being again divided into two parts, A and B, one of these by turns was set to keep a night-watch. The messing for the party was at first brought from their lodging house in the form of *bento* (lunch); but as their food supplied was of such inferior quality as to give but little nourishment, the arrangement was soon after put an end to, the doctors and pharmacists being made to mess together at the same table as the naval medical officers, while the food for the nurses was prepared together with that for warrant officers and seamen by obtaining the same materials as were obtained for the men of the Navy in general from the naval supply contractors, the cost thereof being defrayed by the party itself.

4. Volunteer Nurses' Association.

The Volunteer Nurses' Association was first formed by seventy benevolent ladies of the high officials of the Navy and Army, resident at Sasebo at the

beginning of the war. Sanction was obtained, on March 2, 1904, from Commander-in-Chief Sameshima with the approval of the Minister of the Navy.

The President was Madame Sameshima, Chief Manager, Madame Totsuka. The Association had for its objects visiting the wounded with enquiries, contributions and gifts, and making bandages for use in the hospital.

When large numbers of wounded were being sent back from the front, the members visited the hospital every time the patients came in to express their solicitude by the bedsides and to present the men with various useful articles; such as, dwarfed plants, cigars and cigarettes, fans, handkerchiefs, rolled letter-paper, envelopes, *hanshi* paper, dentifrices, etc., as also fruits and cakes.

The members also attended to the work of manufacturing bandages for use at the Naval Hospital and on board ships of war going out to the front. To this purpose was appropriated a part of the official residence of the commander-in-chief of the station. This was made the working place of the Association, the members attending every day by turns, and holding formal meetings from time to time.

The articles manufactured by the members, with their classes and quantities, are shown below :

Rolled Cotton Bandages to the amount of 3,460 <i>tan</i>	
(Width 10 c.m.)	300 rolls
(„ 8 c.m.)	2,720 do
(„ 6 c.m.).....	13,400 do
Rolled Cotton Gauze	
(Width 10 c.m.)	3,704 <i>tan</i>
(„ 8 c.m.)	300 rolls
(„ 6 c.m.)	6,960 do
(„ 6 c.m.)	710 do
Cotton Gauze Cut for Dressing	700 <i>tan</i>
Broad Cotton Gauze Cut for the Common Size	1,238 do
Bleached Cotton Cut for Triangular Bandages.....	109 pieces
Cotton Quilts lined with Cotton Wool.....	10 do
Small Pads for Splints	76 $\frac{1}{2}$ do

5. Women's Public Service Association.

This association was formed on April 1, 1904, by the good wives of chief warrant officers, warrant officers, and petty officers of the Imperial Navy, resident at Sasebo and devoted itself to washing and mending clothes for the patients at the Naval Hospital, and otherwise helping those in nursing services.

The Association had for its adviser Madame Sameshima and as president Toshi Naito; and had as its working place a part of the official residence of the commander-in-chief of the Station. The members worked with all possible assiduity and the results attained stand as under:

No. of Patients' Clothing washed	3,798 pieces
No. of Patients' Mattresses washed and renewed	73 do
No. of Patients' Bed Sheets washed.....	710 do
No. of Patients' Bandages washed.....	41 <i>Kan</i> 100 <i>momme</i>

Washing utensils, soap and other requisites were supplied by the hospital.

V. Admission of Patients.

1. How Patients were Admitted.

On the receipt of telegram advising about the number and classes of patients to be sent back from the front, dispatched from hospital ships, warships or other vessels carrying the patients, preparations were set on foot on the part of the hospital for receiving them: bedridden patients moved to other places, reserved beds re-arranged, etc.

Notice was also given to the Port Office to get ready the steam-launches and transport boats and at the same time a receiving party was organized and dispatched to the harbour in good time for the arrival of the transports.

The receiving party was composed of a medical officer in command, and a body of stretcher-bearers, together with men charged with the transport of the patients' luggage.

Officer in Command—A Naval Medical Officer.

Two medical officers were kept ready for this purpose at all times, and were sent out by turns to attend to the business.

N.B. When the number of patients to be admitted was very great, as at the time of the battles off Ulsan or in the Japan Sea, three medical officers were appointed to the work.

Second in Command—A head ward-master or a senior sick berth steward.

Squad of Stretcher-bearers—1 sick berth steward, sick berth attendants and a number of hired attendants and men.

The squad of stretcher-bearers was organized on the basis of two men to a unit. A sick berth steward took the command—sick berth attendants and hired men acted as bearers. When the patients were very numerous, laundrymen, servants, coolies, cooks and warehouse-keepers were made to give assistance; e. g. at the time of receiving patients after the battle of Japan Sea, 60 coolies were temporarily hired to help in transportation.

Porters for Patients' Luggage.—1 sick berth steward and a number of hired men.

The boats for the transport of the wounded were three in number. They were Japanese junks, of the type known as *Godairiki*, specially fitted for the purpose. The boats were 59 *shaku* by 13 and had awnings specially provided. One boat could carry 8 stretchers, i.e. 8 severely wounded patients, besides 40 slightly wounded. The latter were placed amidships and in the extreme fore and aft of the vessel. When the severely wounded happened to be very numerous, four more places were reserved for stretchers placed side by side in the boat. Two steam-launches were kept ready to tow the boats, which all belonged to the Port Office, and were handled by men belonging to the same.

The stretchers, to the number of fifty and held constantly ready for use at any moment, were stowed by the side of the entrance to the provisional ward.

The medical officer in command of the receiving party started ahead of the others, in a steam launch, for the ship that was carrying the patients. Here he received from the medical officer the necessary lists with medical history sheets and a detailed statement of each case, and was thus enabled to determine the ward to which the patient was to be sent, according to the nature of the disease. He then handed to each patient a ticket marked with the No. and name of the ward, or, if that were impossible, marked the same on the back of the patient's hand; if a stretcher were needed, it was also marked down.

The stretcher-bearers (from 8 to 12 of them) would then get into one of the boats and work at getting the patients into it, while others of their number were waiting at the pier to convey the patients to the Naval Hospital.

The slightly wounded men, requiring no stretchers, were made to walk along in a body under the guidance of a sick berth steward or attendant.

The time required for one transport boat to receive patients by the above method is roughly as below :

1. From the time when notice to get ready was received at the hospital until the departure of the receiving party	10 min.
2. Going from hospital to pier	5 „
3. From pier to ship	10 „
4. Transferring patients to boats	40 „
5. From ship back to pier	12 „
6. From landing until entering the hospital	20 „
Total	1 h. 37 min.

When the number of patients was less than 50, a single run with one boat was sufficient ; but several runs with several boats were required at times, e.g. at the time when the wounded at the battles off Ulsan or the Japan Sea were being brought in. When the patients were brought into the hospital, the medical officers on duty first examined the medical history sheets of the patients and then handed the patients over to the medical officers in charge of the different wards, at the same time entering their names in the register book of the hospital. The medical officers went through all the tedious work of making out dietary notices, sending reports to head quarters, etc.; and after that they make a round of visits to the patients under their care, making out the daily clinical record of each patient, giving prescriptions, attending to treatment, etc.

Extremely busy times were experienced on account of the great number of patients at the time of the battles off Ulsan and of the Japan Sea, and after the explosion on board the *Mikasa*.

It was on August 15, 1904, that the wounded at the battle off Ulsan came into the hospital. It was at a time when the patients in the hospital already numbered 314, and when all the officers were consequently in full work. Just

at such a time a large number of wounded entered the hospital all at once—29 from each of the war ships, *Izumo*, *Iwate*, *Azuma*, and *Tokiwa*, besides 177 sick and wounded prisoners from the *Rurik*.

The wounded in the battle of the Japan Sea were received during three successive days from the 29th to 31st of May, 1905.

The wounded from both sides of the contest coming in succession into the hospital, their number soon reached 326, the in-patients already numbering 276 ; so that every ward was literally overcrowded.

The explosion on the *Mikasa* occurred at 12.30 a.m. on the 11th of September 1905. The time was towards the conclusion of the war ; and the medical officers, as well as the members of the Red Cross Relief Party, were most of them spending the night outside the hospital, when, all of a sudden a loud explosion in the dead of night told them that some catastrophe had occurred. With all possible haste everybody rushed back to the hospital, a squad of stretcher-bearers was quickly dispatched, and the patients in provisional pavilions Nos. 1, 2, and 3 were removed to other places in order to prepare for the reception of the expected patients.

In the operating and dressing rooms new arrangements were at once made to meet the emergency, and the preparations were scarcely completed, when the following patients were received, coming in at intervals between half past two and six a.m.: viz 6 warrant officers and above that rank, and 118 petty officers and seamen (including hired men).

As the greater part of the above patients had been scalded almost all over the body, much time was spent in dressing and bandaging, but few operations were needed, so that by 7 a.m. the treatment was entirely finished. Of the remaining patients, those who had been temporarily received on board other ships were subsequently admitted into the hospital : viz 4 on the 11th, 53 on the 12th, and 3 on the 13th of the same month ; so that the total patients received in connection with the *Mikasa* explosion were 15 warrant officers and above, 162 petty officers and seamen and 7 hired men, making altogether 184. Of these 155 belonged to the *Mikasa*, 9 to the *Shikishima*, 8 to the Port Office, 4 each to the *Asashi* and *Fuji* and 2 each to the *Tatsuta* and *Nippon Maru*.

The majority of the patients were sealded all over their body ; and pitiful to say, many died every day—i.e., 14 on the 11th of September, another 14 on the 12th, 6 on the 13th, 3 on the 14th, again 3 on the 15th, 2 on the 16th and 1 on the 18th, together making a total of 43 persons “ passed away ”.

2. Patients Admitted.

The total number of sick and wounded admitted into the hospital during the war was 3,947 from the front and 1,133 home patients (inclusive of 93 who became new patients from having contracted another illness while in the hospital), 435 prisoners and men of the Russian Medical Corps and other foreigners, making altogether 5,515 ; the days' sickness, 189,917, making an average number of 307.3 per day.

The results were as follows :—

Convalescents	2,768, or 50. 19%
Treatment discontinued	416 or 7.54%
Transferred to other hospital (including prisoners transferred) ...	1,514 or 27.45%
Invalided	350 or 6.35%
Died	171 or 3.10%
The patients remaining	296 or 5.37%

Kinds of Patients.	Total Admis- sion.	Days' Sickness	Re- covery	Removal to other Hospitals	In- valided	Died	Patients Remaining
Wounded in the actual en- gagement.	462	25,035	228	192	18	13	11
Sick and wounded among men of the Navy with no relation to the actual en- gagement.	4,040	128,256	2,222	1,117	332	118	251
Sick and wounded among hired-men without any re- lation to the actual engage- ment.	578	18,404	507	15	—	22	34

Sick and wounded among prisoners.	429	18,119	222	189	—	18	—
Russian Medical Corps and other foreigners.	6	103	5	1	—	—	—
Total	5,515	189,917	3,184	1,514	350	171	296

The following tables show the number of Patients arranged according to the classification of diseases, and their termination.

1. PATIENTS AMONG MEN OF THE NAVY.

Disease or Injury	Total Admission	Days' Sickness	Recovery	Removal to other Hospitals	In-validated	Died	Patients Remaining
General Diseases.....	626	18,715	480	75	12	27	32
Diseases of the Nervous System	151	5,590	58	41	33	4	15
Diseases of the Respiratory System	767	29,712	253	236	220	17	41
Diseases of the Circulatory System	60	2,229	29	23	2	3	3
Diseases of the Digestive System	441	11,711	291	117	11	10	12
Diseases of the Genito-Urinary System	121	4,307	72	31	3	2	13
Venereal Diseases.....	857	25,460	460	339	1	—	57
Diseases and Injuries of the Eye	99	3,686	51	36	8	—	4
Diseases and Injuries of the Ear.....	44	1,700	17	20	4	—	3
Diseases of the Skin and Connective Tissue	273	7,240	212	43	1	1	16
Diseases of the Organs of Locomotion	100	4,745	55	30	9	1	5
Injuries	499	13,140	244	125	28	52	50

Kinds of Patients	Total Admission	Day's Sickness	Recovery	Removal to other Hospitals	Invalided	Died	Patients Remaining
Injuries in Actual Battles...	462	25,035	228	192	18	13	11
Other Wounds and Injuries	2	21	—	1	—	1	—
Total	4,502	153,291	2,450	1,309	350	131	262

Remark: In the above figures, there are comprised 235 officers and warrant officers and among the wounded in the battle there are 11 soldiers (Army), a civilian judge-advocate and 8 hired men but no prisoners.

2. PATIENTS OTHER THAN THE ENLISTED MEN OF NAVY.

(Workmen, established men, hired men etc.)

Disease or Injury	Total Admission	Days' Sickness	Recovery	Removal to other Hospitals	Died	Patients Remaining
General Diseases	112	3,066	101	—	5	6
Diseases of the Nervous System	10	231	8	2	—	—
Diseases of the Respiratory System.....	56	1,210	46	3	4	3
Diseases of the Circulatory System ...	9	199	9	—	—	—
Diseases of the Digestive System	57	877	52	3	1	1
Diseases of the Genito-Urinary System	14	288	12	1	1	—
Venereal Diseases	17	547	14	3	—	—
Diseases and Injuries of the Eye.....	15	335	12	—	—	3
Diseases and Injuries of the Ear.....	2	34	2	—	—	—
Diseases of the Skin and Connective Tissue	8	562	7	—	—	1
Diseases of the Organs of Locomotion	11	598	10	—	—	1
Injuries	266	10,442	233	3	11	19
Other Wounds and Injuries	1	15	1	—	—	—
Total	578	18,404	507	15	22	34

3.—Prisoner-Invalids and Foreign Patients.

The total prisoner-invalids received during the war numbered 429, to which 6 men of the Russian Medical Corps and other foreigners being added, the whole came up to 435. The number of their days' sickness was 18,222 and the results showed 227 completely recovered, 18 dead and 190 cases of discontinued treatment and discharge.

SICK AND WOUNDED PRISONERS.

Locality.	Officers and Warrant Officers		Petty Officers & Others				Total.
	Wounded in Action	Ordinary *	Wounded in Action	Injuries with no Relation to Actual Engagement	Ordinary *	Venereal	
Captured ships lying in the port of Sasebo.....	—	—	—	2	5	—	7
Torpedo Boat Destroyer <i>Steregut-schi</i>	—	—	2	—	—	—	2
Cruiser <i>Rurik</i> ...	8	—	178	—	2	—	188
Various ships captured at the battle of Japan Sea	22	2	225	—	32	2	283
Total.....	30	2	405	2	39	2	480

* i. e. Diseases other than injuries and venereal affections.

N. B. In addition to the above, there were 2 wounded in action, 2 medical cases among the members of the Russian Medical Corps, and 1 wounded and 1 medical case among the foreigners.

4. Food, Clothing, and Articles of Consumption for Prisoner Patients.

The dietary for the prisoners was provided on the scale of *yen* 1.20 per day for officers, 55 *sen* for warrant officers and others of equal rank, and 35 *sen* for petty officers and others, according to the Provisions of Art. II of the Prisoners' Dietary Regulations in the Instruction No. 44 dated February 29, 1904. As a matter of fact a variety of nourishment was offered according to the nature of

the diseases by changing cuisine every day and in order better to suit the tastes of the prisoners a plan was adopted later on, by which a certain number of men was selected from among the convalescent prisoners who had some knowledge of Russian cuisine, and these were made to take turns in the cooking.

Particular care was taken of the fare offered to Admiral Rojestvensky. With aid afforded by the Naval Station a monthly allowance of 55 *yen* was granted, with which a Russian cook was hired at Nagasaki to attend solely to the cooking for the Admiral. Some of the bills of fare, for the prisoners in hospital will be found below.

BILL OF FARE. July 1st, 1905.

Official Grade.	Breakfast.	Lunch.	Dinner.
For Officers and Others of Equal Rank.	Bread, Soup, Eggs, Butter, *Tea, Sugar, Milk.	Bread, Soup, Fried Fish, Roast Beef, Sago Pudding, Butter, Tea and Sugar, Milk.	Bread, Soup, Boiled Beef, Roast Chicken, Ox-tail Stew, Butter, Tea and Sugar, Milk.
For Warrant Officers or Others of Equal Rank	Bread, Soup, Eggs, Butter, Tea, Sugar, Milk.	Bread, Soup, Roast Beef, Tea, Sugar, Milk.	Bread, Soup, Roast Chicken, Butter, Tea, Sugar, Milk.
For Petty Officers and Others.	Bread, Butter, Tea, Sugar.	Bread, Butter, Meat with Vegetables Soup, Tea, Sugar.	Bread, Butter, Boiled Beef, Tea, Sugar.

BILL OF FARE. July 2nd, 1905.

Official Grade.	Breakfast.	Lunch.	Dinner.
For Officers and above or Others of Equal Rank.	Same as before.	Bread, Soup, Boiled Fish, Beefsteak, Butter, Tea, Sugar, Milk, Loquats.	Bread, Soup, Stewed Chicken, Beef Cutlets, Butter, Tea, Sugar, Milk, Bread Pudding.

* Black tea is meant.

For Warrant Officers or Others of Equal Rank.	Same as before.	Bread, Soup, Boiled Fish, Butter, Tea, Sugar, Milk, Loquats.	Bread, Soup, Beef Cutlets, Butter, Tea, Sugar, Milk.
For Petty Officers and Others.	Same as before.	Bread, Butter, Boiled Fish, Tea, Sugar.	Butter, Meat, with Vegetables, Bread Soup, Tea, Sugar.

BILL OF FARE. July 3rd, 1905.

Official Grade.	Breakfast.	Lunch.	Dinner.
For Officers and above or Others of Equal Rank.	Same as before.	Bread, Soup, Fried fish, Filet of beef, Butter, Tea, Sugar, Milk, Ice-cream.	Bread, Soup, Chicken cutlets, Mince, Butter, Tea, Sugar, Milk, Custard jelly.
For Warrant Officers or Others of Equal Rank	Same as before.	Bread, Soup, Fried fish, Butter, Tea, Sugar, Milk.	Bread, Soup, Mince, Butter, Tea, Sugar, Milk.
For Petty Officers and Other	Same as before.	Bread, Butter, Fried Fish, Tea, Sugar.	Bread, Butter, Meat with Vegetables, Soup, Tea, Sugar.

No special clothing was provided for the prisoners, whose dress was the same as that of ordinary patients.

Articles of daily consumption, such as tobacco, paper, slippers, etc. were provided, and they were allowed to purchase these within the limit of 30 *sen* per day for officers and others of equal rank, 15 *sen* for warrant officers and others equal in rank, and 5 *sen* for petty officers and others.

5. Sick-Wards and Rooms for Invalid, Prisoners, Medical and Social Treatment given.

Of the invalid prisoners ex *Rurik* those above warrant officers were admitted into the rooms of pavilions Nos. 3 and 4., petty officers and others into the provisional Nos. 2, 3 and 4. Of those from the Second Russian Pacific Squadron, the Admiral was received into the small upstairs ward of pavilion No. 1, and those above the grade of warrant officers into pavilion No. 2; while petty officers and others were taken into pavilions Nos. 2, 3 as also into No. 2 infectious pavilion, which had never yet been used.

The medical and social treatment given were exactly the same as those given to our ordinary patients. All the officials of the hospital felt deep sympathy for the prisoners and were kind and gentle to them.

There were two sick berth stewards who understood Russian and acted as interpreters for them in their every day business. Besides these, the official interpreters attached to the Naval Station came to visit the hospital from time to time, and interpreted, whenever necessary, for the prisoners.

The officer-prisoners, mostly spoke either German, French or English, so that there was little fear of misunderstandings; but the petty officers and others scarcely ever understood any foreign tongue, so that the inconveniences felt on both sides may well be imagined.

VI. Out-Patients, Physical Examination and Vaccination.

The out-patients, when classified, may be arranged as below :—Under Class I come the petty officers and seamen belonging to the Naval Station, the Naval Hospital and the Direction of Accounts and Supplies at the Station. These numbered 72 in all, the total number of days' sickness being 1,268 with an average of 2 per day.

To Class II belong the crews of vessels chartered for naval service with no medical officers on board. These numbered 932, their total days' sickness being 8,055 with an average of 11 per day.

Class III comprises the civilians attached to the various offices of the Naval Station, numbering altogether 1,119, their total days' sickness being 13,153 with

an average of 21 per day.

In Class IV are included families of seamen at the front. Their number was 288. To this class of patients were given prescriptions only, the results of treatment and number of days' sickness not being taken into account.

Medical examinations were prescribed for all civilian candidates for various offices in the Naval Station, as well as for coolies to be dispatched to the front.

The number examined was 9,062 with an average of 15 per day. Of these, 7,370 passed the examination satisfactorily, while 1,692 failed.

Vaccination was obligatory for all civilians and coolies bound for the front. 6,420 persons in all were vaccinated, with an average of 10 per day.

VII. Number of Surgical Operations.

As will be seen from the following table, the surgical operations performed during the war, amounted altogether to 1,073, including both serious and slight cases. This number, consisting principally of operations done in the operating room and dressing room, does not include minor cases, such as taking out small fragment of shells or bones, small graftings of skin, incisions of small suppurations, secondary sutures, or scraping off crethistic granulations etc.

Cases of venereal diseases being rare—much rarer than in ordinary times bubo-operations did not come to more than 384 cases. The remarkable fewness of amputations for wounds received in action or otherwise was chiefly due to the fact that our surgeons did everything in their power to save limbs wherever possible.

Their course and results were as follows :—

Name and Character of Operation.	No. of cases	Duration of Treatment after Operation.					Result.				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment discontinued	
Removal of Carcinoma	1	—	—	—	—	1	—	1	—	—	Carcinoma of tongue.

Name and Character of Operation	No. of cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment discontinued	
Extirpation of Cystic Thyroid Gland	1	—	—	—	—	1	1	—	—	—	
Neurectasy of Sciatic Nerve	1	—	—	—	—	1	—	1	—	—	Separation of nerve from adhesions of the nerve to cicatrices in consequence of gun- shot wound.
Neurorrhaphy (nerve suture)	4	—	—	—	—	4	—	3	—	1	Sciatic nerve 1, ex- ternal popliteal nerve 1, ulnar nerve 1, pos- terior interosseous nerve 1.
Operation for Chro- nic Hypertrophic Rhinitis	23	23	—	—	—	—	23	—	—	—	Resection of superior turbinate bone 3, that of inferior turbinate bone all the others.
Removal of Nasal Polypi	14	5	4	3	1	1	14	—	—	—	
Tracheotomy	1	1	—	—	—	—	—	—	1	—	
Paracentesis Thora- cis.....	36	5	7	3	6	15	5	5	4	22	Pleuro-pneumonia 1. Haemo-thorax. { All Pneumo-thorax. { the Pyo-thorax. { others
Excision of Ribs ...	12	—	2	2	2	6	6	2	3	1	Haemo-pneumo-tho- rax.....1. Injury .....1. Pyo-thorax .....4. Caries of Ribs .....5.
Ligation of Artery...	4	—	4	—	—	—	—	3	—	1	Radial Artery.....2. Femoral „2.
Varicoceleotomy	2	—	2	—	—	—	2	—	—	—	
Ligation of Trauma- tic Varix.....	1	—	—	—	1	—	1	—	—	—	Varix of the upper arm

Removal of Lymphatic Glands. (lymphadenitis)	22	3	5	6	3	5	11	4	—	7	Cervical glands .....9. Axillar glands .....3. Inguinal glands, all the others.
Tonsillotomy	3	3	—	—	—	—	2	1	—	—	
Excision of Ramula ...	1	—	1	—	—	—	1	—	—	—	
Radical Treatment (operation) of Hernia	9	—	1	3	4	1	9	—	—	—	Inguinal hernia
Paracentesis Abdominis (tapping the abdomen)	1	—	—	1	—	—	—	—	1	—	Tubercular peritonitis
Laparotomy (abdominal section or celiotomy).....	7	3	—	—	2	2	1	1	4	1	Tubercular peritonitis .....2 Traumatic peritonitis after penetrating wound .....1 Appendicitis.....1 Intestinal obstruction (or Ileus) .....1 Abscess of iliac fossa .....2
Appendicectomy ...	2	—	—	—	1	1	2	—	—	—	
Radical Treatment (operation) of Piles...	33	1	2	9	13	8	13	10	1	9	
Syringotomy.....	21	3	4	5	5	4	9	4	—	8	Complete fistula .....4 Incomplete „2
Operation for Prolapsus Ani	3	—	—	—	3	—	—	3	—	—	
Lithotomy.....	1	—	—	1	—	—	1	—	—	—	Supra pubic lithotomy (or Sectio alta).
Operation for Phymosis	2	1	—	—	1	—	1	—	—	1	
Urethrotomy	2	1	—	—	—	1	1	—	—	1	Rupture of urethra 1 Stricture „ „ 1
Incision of Suppurative Epididymitis	1	1	—	—	—	—	—	—	—	1	Gonorrheal suppurative epididymitis

Name and Character of Operation	No. of cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment discontinued	
Orchotomy (or castration)	9	2	1	—	3	3	5	—	—	4	Tubercular Orchitis 6 Suppurative Orchitis 1 Gummata .....1 Injury .....1
Radical Treatment of Hydrocele (testis) ...	9	—	3	3	3	—	8	1	—	—	
Incision of Bubo (venereal).....	223	20	48	45	63	47	90	3	—	130	Among these bilateral cases 29
Enneleation of Bubo (venereal)	148	8	26	28	50	36	93	1	—	54	Bilateral cases 27
Aspiration of Suppurated Bubo (venereal)	13	3	2	2	5	1	3	1	—	9	
Removal of Foreign Bodies from the Eye Ball	1	—	—	—	1	—	—	1	—	—	
Extraction of Cataract	3	—	—	—	2	1	1	1	—	1	
Evisceration of the Eye	1	—	—	—	1	—	1	—	—	—	
Enneleation of the Eye	6	—	—	1	4	1	6	—	—	—	{ Left eye-ball 2, right eye-ball 4
Abscess opened	60	3	13	11	8	25	29	12	2	17	
Aspiration (or puncture) of Abscess	5	—	—	3	—	2	—	—	1	4	
Plastic Operation	7	—	—	—	—	1	1	—	—	—	Eyelids & lower lip
Skin Grafting	53	17	16	11	9	—	41	9	—	3	
Operation for Contused Wound	38	4	2	5	8	19	26	8	2	2	{ Only cases performed under anesthetization
Scraping of Bones.....	8	—	—	—	4	4	3	1	1	3	{ Arm.....1 Forearm .....1 Caries of ribs.....5 Tibia .....1

Sequestrotomy	8	—	3	3	—	2	4	2	1	1	{ Inferior maxillary bone 2 Frontal bone 1 Bones of upper and lower extremities, all the others
Removal of Osteoma	1	—	—	1	—	—	1	—	—	—	
Osteorrhaphy (suturing of fractured bones).....	7	—	1	—	—	6	3	1	1	2	
Resection of Bones ...	11	1	1	1	4	4	7	—	3	1	{ Humerus .....2 Scapula .....1 Inferior maxillary bone .....1 Femur .....2 Tibia .....1
Trepanation (or trephining of the skull)	2	1	—	—	1	—	1	—	1	—	
Forcible Correction of Ankylosis	1	—	—	—	—	1	—	—	—	1	
Tenorrhaphy (or tenosuture)	1	—	—	—	1	—	—	1	—	—	Ankylosis in consequence of suppurative inflammation of knee-joint
Amputation of the Arm	3	—	—	—	1	2	2	—	—	1	
Amputation of the Forearm	3	2	—	—	1	—	—	—	2	1	
Amputation of the Thigh	11	2	—	3	4	2	—	—	3	8	
Amputation of the Leg.....	7	2	—	2	2	1	2	—	2	3	
Amputation of Fingers and Toes	20	—	3	6	7	4	15	1	—	4	
Amputation at the Shoulder-Joint	4	1	—	1	1	1	1	1	2	—	
Amputation at the Elbow-Joint	1	—	—	—	1	—	—	1	—	—	
Amputation through the Knee-Joint.....	1	—	—	—	1	—	—	—	—	1	
Interphalangeal Amputation (of fingers & toes)	13	2	2	4	3	2	10	—	1	2	
Incision of Joint (arthrotomy).....	1	1	—	—	—	—	—	—	—	1	
Puncture at the Joint (tapping of the joint)	2	—	1	—	—	1	—	—	1	1	
											Suppurative arthritis of the knee Hip-joint.....1 Ankle-joint .....1

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment Discontinued	
Excision of Joint.....	2	1	1	—	—	—	—	1	1	—	Hip-joint.....2
Reduction of the Fracture	71	9	7	5	12	38	40	8	4	19	{ Lower extremity...33 { Upper „22 { Ribs .....4 { Metacarpus .....1 { Clavicle .....5 { Inferior maxillary bone 2 { Bones of the skull, all the others
Reduction of Dislo- cation	4	3	—	—	1	—	3	—	—	1	{ Shoulder-joint.....2 { Wrist „2
Removal of Foreign Bodies from Wounds	113	12	12	17	28	44	61	12	5	35	{ Iron splinters { Wooden splinters { Fragments of bones
Total	1,073	144	174	185	271	299	560	104	47	362	

VIII. Laboratory Work.

The work done at the laboratory consisted chiefly of physical and chemical testing done on drugs, medical instruments, utensils, etc. as well as on drinking water. In consequence of the vast increase in the amount of goods purchased during the war time, besides the large quantity of spoils of war, as also of the special constructions of water works, etc., the number of tests and experiments made was enormously increased, the total for one year and 9 months from February, 1904 to October, 1905, being 1,765 cases with an average of 84 per month; whereas the average for the year preceding the war was only 38.6 per month. The increase was more than double that of the preceding year.

Work like this, requiring special skill and involving the consequent difficulty of obtaining temporary assistance, rendered it necessary not only to work day and

night, but at times, when the work was pressing, to call in the assistance of the apothecaries of the hospital as well as those of Red Cross Society. In this way we were enabled to fulfil our functions.

The statistics of experiments made with their classification and dates may be seen from the following :—

	Medical Stores	Surgical Stores	Victuals	Table Ware	Drinking Water	Sundries	Total
February 1904	17	11	5	4	8	3	48
March 1904	32	17	6	—	4	—	59
April 1904	44	14	5	—	19	—	82
May 1904	71	10	11	3	8	10	113
June 1904	54	5	11	4	12	—	86
July 1904	30	11	21	3	2	1	68
August 1904	61	5	14	—	5	2	87
September 1904.....	49	2	3	—	6	—	60
October 1904	18	4	4	—	3	5	34
November 1904	21	3	14	—	11	2	51
December 1904	24	13	9	—	6	—	52
January 1905.....	22	7	6	—	6	—	41
February 1905	41	16	20	—	10	1	88
March 1905	39	10	39	—	3	1	92
April 1905	52	13	13	—	9	1	88
May 1905	97	18	30	3	5	2	155
June 1905	38	13	39	4	—	2	96
July 1905	99	17	20	—	—	3	139
August 1905	93	13	6	—	5	1	118
September 1905	131	11	6	—	1	—	149
October 1905	24	12	8	—	9	6	59
Total	1,057	225	290	21	132	40	1,765

N. B. The above figures comprise spoils of war, namely, medicines 207, surgical stores 4, and victuals 132, amounting in total to 343.

IX. Hyakken-Bana Quarantine Establishment.

The necessity of establishing a quarantine establishment in connection with the Sasebo Naval Station had already been recognized in time of peace and had long been hoped for, though circumstances had prevented the realization of the hope. Now, however, at the opening of the war it became so urgent and indispensable, that it had to be established; the expenses being defrayed out of extraordinary expenditure as shown below:—

Name	Belongings	Structure	Building Area	Quantity	Building Expense
Disinfecting Room		Single-storied in wood	<i>Tsubo</i> * 29.250		<i>yen</i> 1,521.280
	Drains	Stone	—	<i>Ken</i> † 33.000	74.140
	Cistern	Stone	—	one	5.000
Boiler-Room		Single-storied in wood	32.750	—	1,201.760
	Drains	Stone		26.500	45.950
Bath-Room		Single-storied in wood	63.750	—	3,078.340
	Drains	Stone	—	27.500	48.270
Keepers' Room		Wood (single-storied)	10.500	—	504.429
	Drains	Stone	—	27.500	36.779
Servants Room and Kitchen		Single-storied in wood	12.500	—	597.516
	Covered corridor	Single-storied in wood	3.750	—	120.201
	W. C.	Single-storied in wood	3.000	—	242.681
	Drains	Stone	—	33.200	44.726
Reservoir		Brick	—	one	46,08.570
	Mains	{Iron pipes	—	310.000	34.889
	Supply Pipes	Iron	—	seventeen	150.386
	Valve	„	—	one	15.000

Water Tank		Brick	—	three	279.815
	Water-gauze	Brass	—	one	8.000
Reception and Waiting Room		Single-storied in Wood	132.000	—	4,149.370
	W. C.	„	4.000	—	336.908
	„ „	„	4.000	—	336.908
	Passage	„	3.000	—	96.161
	Drains	Stone	—	^{ken} 82.800	123.054
Ward Barrack		Single-storied in Wood	65.000	—	2,311.330
	W. C.	„	3.000	—	262.681
	Passage	„	2.000	—	64.108
	Drains	Stone	—	53.500	93.201
Water-closet		Single-storied in Wood	1.250	—	105.284
„		„	1.250	—	105.284
„		„	1.000	—	84.227
„		„	1.000	—	84.227
	Blind Fence	Wood	—	10.000	20.000
Pier		Stone & iron	—	two	4,951.440
Fence (Palisade)		Wood	—	168.250	659.190
Board Fence		Wood	—	12.666	58.850
Stone Wall		Stone	—	143.000	1,360.750
Destructor Furnace		Brick	—	one	139.930
Light-Railway		12 lb. rail	—	263.000	1,210.300

Total: Yen 29,170.935

* A *Tsubo*=36 sq. *shaku*. A *shaku*=.9938 English feet.

† A *Ken*=6 *Shaku*

In addition to the above, the following disbursements were made; *yen* 2,695.80 for purchase of land 5,361 *tsubo* in area, *yen* 643.750 for laying out of land, *yen* 4,635.000 for two autoclaves, *yen* 645,415 for two suction pumps and iron pipes, *yen* 624.780 for telephone plant, altogether *yen* 9,244.745, to which being added 29,170.935 for building expense, the total expense amounted to *yen* 38,415.680.

The building of the present quarantine establishment was begun on March 29, 1904 and finished on June 30, same year.

The different sections of the building are summarily given below:—

Disinfection-Room.—This contains two apartments, a steam disinfecting chamber and a chemical disinfecting chamber, each of which is divided into infected and non-infected compartments.

Boiler-Room.—This room has been made comparatively large in anticipation of the future necessity of installing electric plants whenever another boiler and a dynamo machine are set up. The present single boiler, serves for disinfecting and bathing purposes.

Bath-Room.—This room, too, has been made rather large in anticipation of future extension, when, some time hereafter, the reception and waiting room, the ward barrack, etc. are enlarged to accommodate a larger number of persons. The bath-room is divided into three sections, one for petty officers and others, one for warrant officers and one for officers.

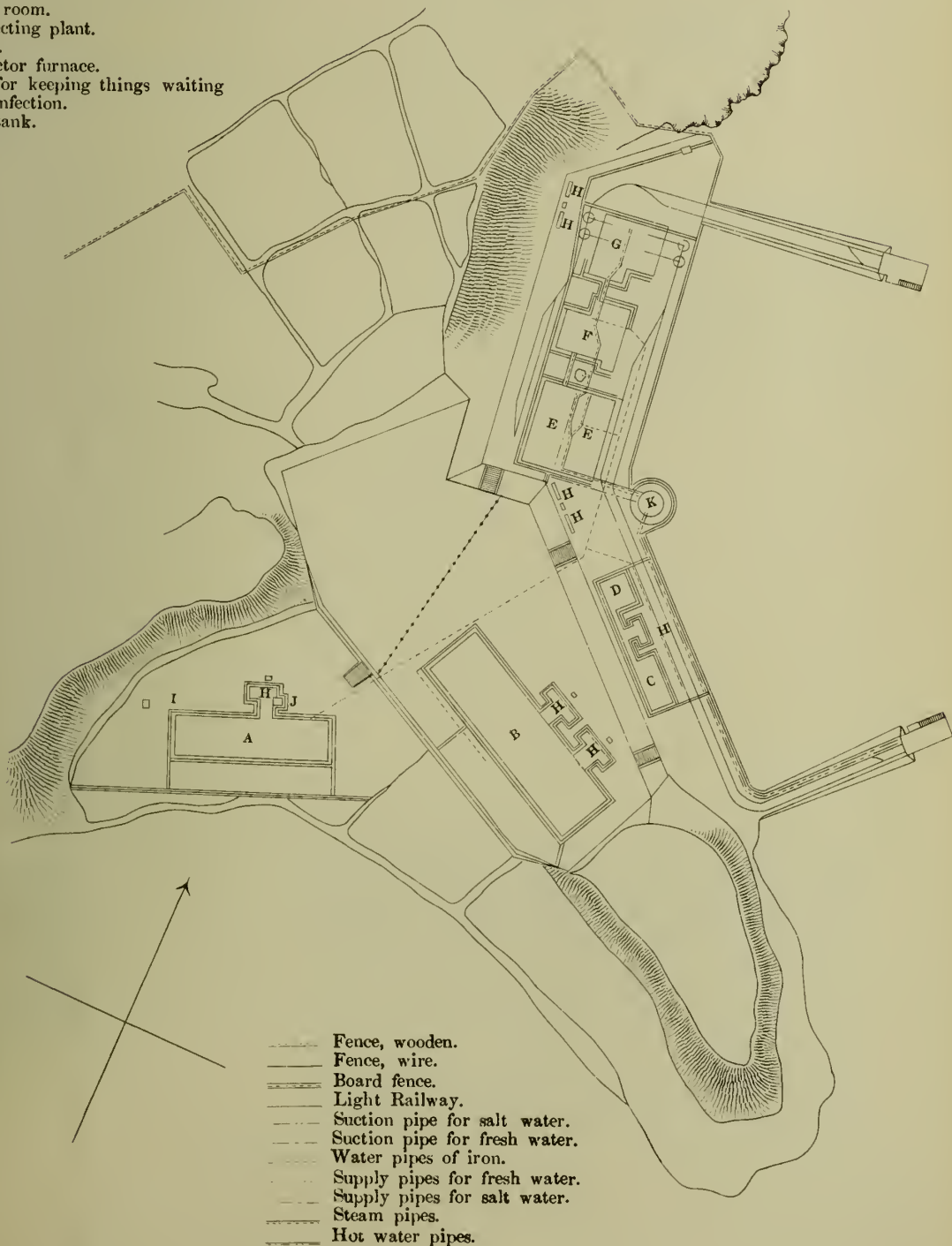
Sea water is used for bathing in, and fresh water is provided only for washing and face-ablution, after taking the bath. The fresh water is supplied from water-boats belonging to the Port-Office, which bring out water from the water-works.

The water, both cold and warm, for lavatory use, is conducted through water-pipes.

Water-Cistern.—The rocky geological structure of Hyakken-bana makes a natural supply of pure water impossible, and therefore necessitates the storage of water in a large reservoir. The present reservoir is cylindrical in shape and is built of bricks, rising above the ground to the height of 30 *shaku*. The interior consists of three layers, the lowest being the pumping chamber, the middle one for holding sea-water and the highest for pure-water. The sea-water chamber is

PLAN OF HYAKKENBANA QUARANTINE STATION.

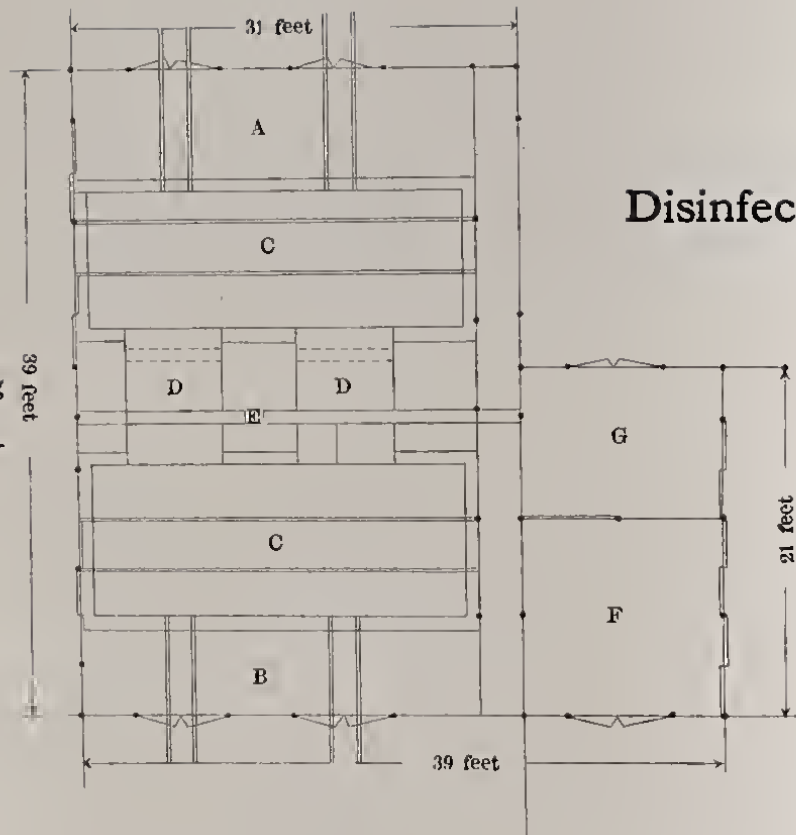
- A. Ward barrack.
- B. Waiting room.
- C. Servant's room and kitchen.
- D. Room for officials in charge of the station.
- E. Bathroom.
- F. Boiler room.
- G. Disinfecting plant.
- H. Closets.
- I. Destructor furnace.
- J. Store for keeping things waiting disinfection.
- K. Watertank.



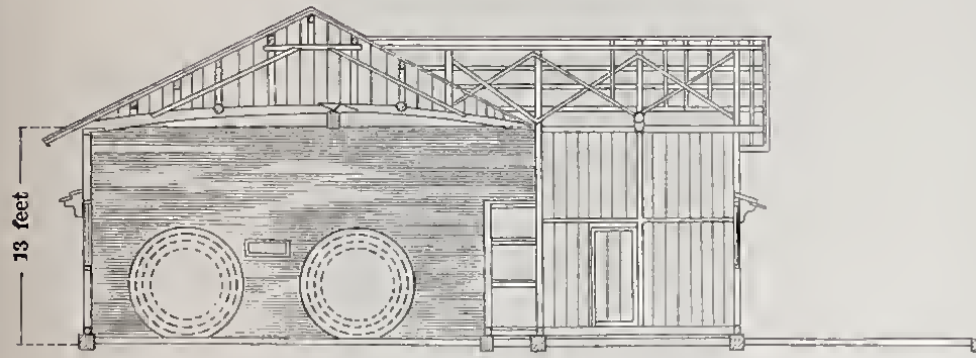


PLAN OF HYAKKENBANA QUARANTINE STATION.

- Disinfecting building.**
- A. Noninfected room.
 - B. Infected room.
 - C. Traverser railway.
 - D. Steam disinfector or autoclave.
 - E. Brickwall.
 - F. Infected room of chemical disinfecting chamber.
 - G. Noninfected room of chemical disinfecting chamber.

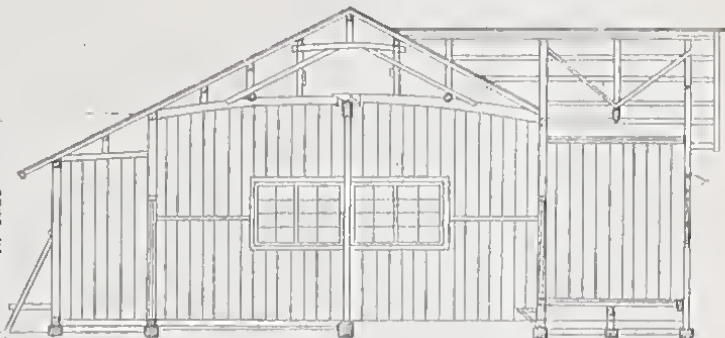
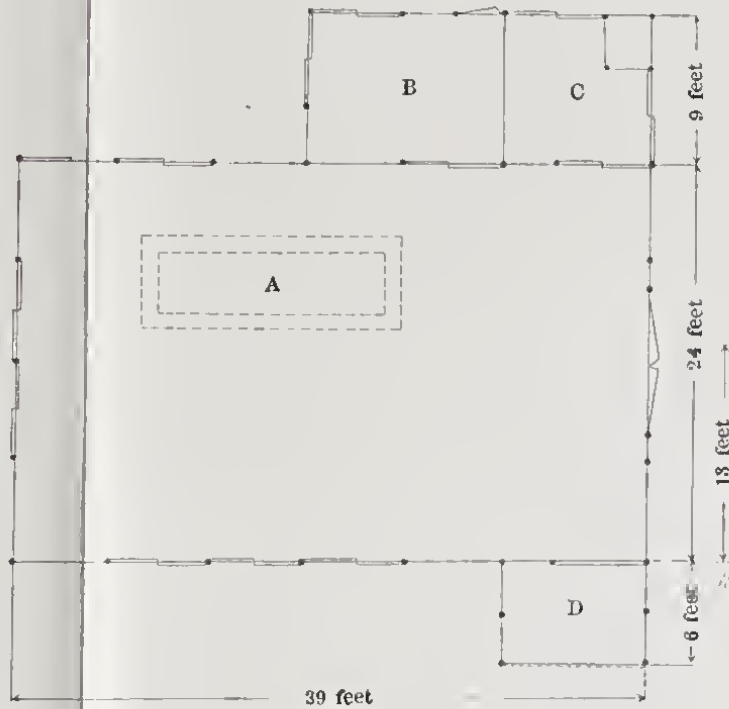


Disinfecting Building.

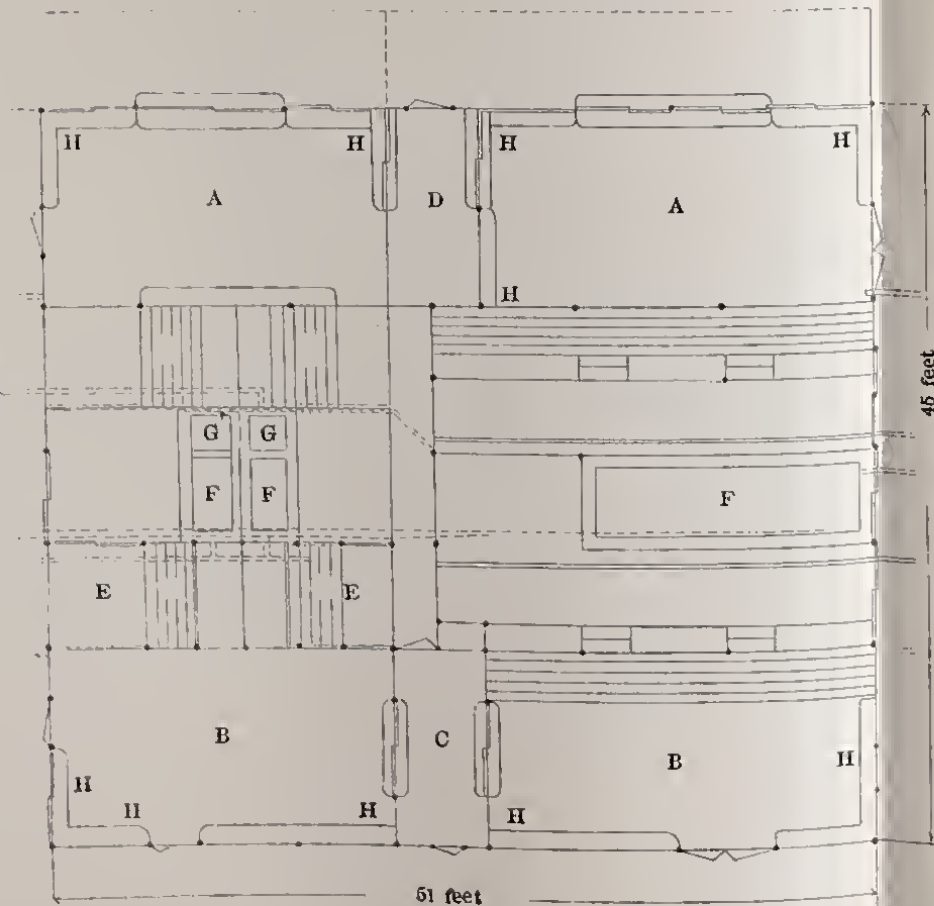


Boiler Room.

- Boiler Room.**
- A. Boiler.
 - B. Dynamo room.
 - C. Keepers' room.
 - D. Coal.



- Bathroom.**
- A. Waiting room for persons after disinfection.
 - B. Waiting room for persons awaiting disinfection.
 - C. Place where valuable things are to be deposited.
 - D. Place where valuable things are returned.
 - E. Room for depositing clothing.
 - F. Salt water bath.
 - G. Fresh water bath.
 - H. Benches.



Bathroom.





capable of containing $46\frac{1}{2}$ tons, whilst that for pure water can contain 75 tons.

In the pumping chamber there are two pumps which send up sea-water and fresh into their respective chambers. Each of the iron pipes for the suction of fresh and sea water is 0.2 *shaku* inches in diameter and 292.5 *shaku* in length, extending from the reservoir to the end of the non-infected pier where water, both fresh and salt, is taken from the water-boat. Iron pipes conduct the sea water into the bathroom and fresh water into the boiler-room, kitchen, reception and waiting room and bathroom.

Water-Tanks.—In addition to the above reservoir there are three water-tanks of brick. No. 1 stands in the boiler-room, No. 2 in the kitchen, and No. 3 between the bath and boiler-room. The No. 3 tank is connected by pipes for conducting steam from the boiler to heat water for the lavatory. The capacity of each is 8.84 tons.

Reception and Waiting Room.—This room is divided into the following sections: 4 small apartments for officers, 1 for warrant officers, 1 for petty officers, 2 large ones for seamen, and a room for serving food.

The officers' waiting room admits two patients at one time; the warrant officers' room 6, each is provided with beds. The petty officers' and men's waiting rooms have mats (*tatami*), 33 mats in the petty officers' room and 60 mats in each of the two rooms for the blue jackets. The waiting rooms, as they are at present, are rather too small, admitting not more than 200 persons at a time; which is only half the number of a second class cruiser's crew. When a larger number come together it becomes necessary to pitch tents to receive them.

The Ward Barrack.—This is divided into a medical officers' room, a nurses' room—which also serves for a dispensary, a serving room, a store-room,—three rooms for serious patients, and rooms for diagnosed patients as well as for those awaiting diagnosis. With the exception of the medical officers' room, the dispensary, and the store-room, the floors of all the rooms are of concrete facing, the three serious patients' rooms having each one bed. In the room for those to be diagnosed, there are 8 beds, whilst in the room for the diagnosed, there are 10, making altogether 21 beds.

Destructor Furnace.—This is built of brick. The rooms for officials and

servants as also the kitchen, are very small. The kitchen has a range and a stove.

Water-Closets.—There are eight water-closets respectively for the non-infected, the infected, those awaiting diagnosis, the patients, and the hospital officials.

The extent of the area as compared with the total number of buildings is a necessary corollary from the nature and function of a Port Quarantine Establishment.

Piers.—There are two distinct piers for the infected and the non-infected. The sea about here being affected a great deal by the ebb and flow of the tide, the piers, built to suit an ebb tide, have proved too high at flood tide for lading and unloading of goods. This is, however, unavoidable. Between the two piers and the disinfection building, light railways have been constructed for the conveyance of goods.

Telephone.—Through the exchange at the Naval Station telephone communication has been established with all the offices at the place.

Autoclaves.—Of a cylindrical double-barrelled pattern. There are two of them installed, both of the the same make, built at the Shibaura Iron-Works, Tokyo, and measuring 7 ft., 6 in. in length, with outer diameter 5 ft. $7\frac{1}{8}$ in. and inner diameter 4 ft. 10 in. The tested water pressure both in the inner and the outer jackets is, 12 lb.; and the steam coming into either jacket is made to pass through a check valve, the safety valve being adjusted to keep the pressure at 6 lb. Besides the cage showing the pressure in the inner and outer jacket, there is a thermometer attached to the outside to show the temperature within.

The number of days this establishment was kept open during the war was 50 days, and the numbers of cases 18. The most noteworthy cases were the entire and thorough disinfection of the warships *Buyo*, *Kongo*, *Tokiwa*, and *Chiyoda* with the whole of their complements, the persons passed through the establishment being 4,332 in number. The carbolic acid expended were 578,700 grammes, and the caustic lime, 175,500 grammes.

SECTION III. KURE NAVAL HOSPITAL.

1. Preparation for the Admission of Patients.

1. Equipment of Pavilions, etc., before the Earthquake.

The proper pavilions of the Kure Naval Hospital are six in number, four

for ordinary patients, one for lunatics and one an emergency pavilion for contagious diseases. They can hold 280 patients.

Towards the end of the year 1903 our fleets assembled at Sasebo, and the Sasebo Naval Hospital, being more than filled with patients, so many of them were transported to the hospital now under consideration, that it was felt that it too was too small for the necessities of the time. Consequently, on December 13, 1903, preparations were started by appropriating for the accommodation of patients the upper stories of the barracks of the Torpedo Division, and 48 of the less serious cases were transported thereinto. This temporary pavilion consisted of two large wards, each with an area of 64 *tsubo* and containing 25 beds. This was called provisional pavilion No. 1.

Temporary Ward Barracks for Infectious Diseases—This was built in the north-east corner of the hospital compound, was begun on February 23 and finished on April 4, 1904. There are two barracks—the one of 60 *tsubo* and the other of 30, besides a building in which a medical officers' room and a nurses' room are provided. To the above are attached rooms for the regular staff of workmen, a mortuary, and a lumber room for articles awaiting disinfection.

The regular number of patients admissible is 21; but light cases can be admitted to the number of 40.

The floor is laid with concrete facing, and the roof is of "Ruberoïd Roofing." Electric light and telephone plant are provided, as also slop-sinks, bathroom, water-closet etc.

Various Equipments.—Eight steam boilers, one water boiler, kitchen utensils and one milk-sterilizer were bought out of current expenses running over the two years, 1903 and 1904; and a steam laundry machine was purchased out of the current expenses for 1903. With this machine 50 unlined hospital dresses can be washed at one time with 40 minutes' work.

Electric Lights.—There were originally 88 electric lamps installed, the number being increased by 26 at this time. A telephone plant was also purchased and installed in the wards as well as in the medical depôt office, the warehouses, etc.

Dynamo-Room for X rays.—This was begun on March 2 and finished on April

8,1904. It is a one-storied wooden house, tile-roofed, covering an area of 9 *tsubo*, with floor in concrete and having a small apartment of 3 mats for the use of the engine-driver.

The Motor, on petroleum motor plan, is capable of generating 110 volt 30 ampère of continuous current. Besides this, the electric current is also drawn from the lines of the Hydro-Electric Co., Ltd., and is connected with the electric lines of the hospital to provide against any extraordinary interruption that may occur.

Operation Room.—This was begun on February 1 and finished on May 31, 1904, and covers an area of 29.7 *tsubo*. It comprises an operating room, preparatory apartment, instrument-room and sterilizing-chamber, all of which are warmed by a steam-heater. The old operating room was transformed by rearranging its interior, into a dressing room.

The X-rays Room.—was begun on September 24 and finished on December 28, 1905—a small room of 6 *tsubo*.

2. Equipments of Ward Pavilions and Barracks, etc., after Earthquake.

A violent shock of earthquake was felt at 2. 45 p.m. on the 2nd of June, 1905. The hospital and its vicinity stood in the centre of the damaged district. Cracks appeared in the ground in many places and the damages to the buildings were very serious. One day previous to this occurrence, notice was received of the expected arrival on June 3 of the Hospital Ship *Kobe Maru* carrying the wounded in the Battle of Japan Sea and other patients numbering 200 in all. Preparations were at once set on foot for their reception by removing the in-patients in pavilions Nos. 1 and 2 (brick building) into the provisional pavilion for infectious diseases and into the temporary wards in the Torpedo Division barracks. Thus prepared, we were awaiting the arrival of the *Kobe Maru* when all of a sudden the earthquake occurred. The brick buildings, which suffered most severely, happening to be empty (for the in-patients had been removed the day before), no injury befell the patients; but all the preparations we had made for the reception of the wounded in battle miscarried, our labour had been in vain.

On the same day at 4 p.m., sooner than was expected, the *Kobe Maru* entered the port, and there came an urgent demand from her for the landing of her wounded patients. All the hospital buildings were more or less damaged, every one of them, as also all the public offices. At such a time the difficulty was obvious of finding suitable houses to be converted into temporary sick-rooms. It further happened that at this time the Sasebo Naval Hospital had got so many wounded patients to be transferred elsewhere, that the authorities there were urgently demanding the speedy return of the *Kobe Maru* for their transportation.

It was, therefore, decided that, first of all, 4 of the severely wounded and 3 of the ordinary patients ex *Kobe Maru* should be taken into the hospital at once, and no effort was spared in hastily fitting up temporary sick-rooms in the store-house for reserve ships and the Naval Court Martial. The director of the hospital and the whole of his staff of workers remained on duty through the whole night, keeping a vigilant watch against the recurrence of earthquake shocks on the one hand, while, on the other, they busied themselves with the preparations for opening the accommodation rooms. Some slight shocks felt at times during the night gave cause of fear to the bedridden patients, many of whom slept not a wink all night. Fortunately, however, the night ended without any serious mishap.

On the following day, June 3, in spite of the heavy rain, we fell to work again on our urgent preparations. We were also busy removing the patients from pavilion No. 3 to the provisional infectious pavilion and to the Torpedo Division barracks, while clearing away the debris and wreck of the earthquake. The work was not quite completed on the following day (4 June); but, as the *Kobe Maru* was in haste to return to Sasebo, we resorted to the device of converting the covered passages between the pavilions into sick-rooms. Here the beds were laid lengthwise in one row, the curtains brought from the deserted wards being used as side-screens. In this way, accommodation was found for 29 of the wounded patients, and an operating room being at once opened, the work of redressing was begun. As to the remaining patients, they were received

partly in the temporary sick-rooms in the storehouse for reserve ships and partly in a similar apartment in the Naval Court Martial Building.

On the 5th of June, the repairs to pavilion No. 3 were finished, and the patients from the covered corridors were at once moved into it. They concluded the whole work of preparation and left nothing more to be desired. No inconvenience was felt the same day in taking in Vice-Admiral Misu wounded in the battle of the Japan Sea.

Temporary Ward Barrack in the Storehouse for Reserve Ships.—At the time of the earthquake there were in the hospital 260 patients. In addition to these, over 180 more from the Hospital Ship *Kobe Maru* were awaiting reception. We were thus forced by unavoidable circumstances to decide that patients should temporarily be received into the storehouse for reserve vessels, to which was removed all the furniture from pavilions Nos. 1 and 2, which had become for the time uninhabitable.

Fixing the number to be admitted at 150, we set to work from 9 p.m. on June, 2, with the preparation of these temporary apartments as well as with repair of buildings. Sick berth stewards and attendants, laundrymen and hired labourers were at work on the business all through the night: on the morning of the next-day (the 3rd) they were relieved by seventy hands from the Naval Barracks and fifty boatmen from the Port Office.

The third story, running the whole length of the three warehouses, was converted into sick-rooms; and the downstairs rooms in one of them into an office, etc. The whole third story was divided into ten apartments. Around and in the centre of each apartment were left spaces for passages. On either side of the passage, in the middle of the apartments, were triple shelves on which to stow utensils and goods for reserve vessels. The very structure of the place made it ill suited for a sick-room; and we were obliged to use the lower shelves as beds by putting straw-mattresses on them, while the upper shelves were used for the reception of trunks, bags, and articles of daily use. The open spaces left at either end of the apartment, having boarded floors, were each occupied with five mattresses laid side by side for beds. Thus 50 beds were provided in each warehouse, making 150 in the three. One large mosquito curtain was spread over

every 2 or 3 beds on the lower floor, and bed-curtains were used for the beds on the shelves, one for each bed.

As for kitchen utensils, etc., e.g. two tents and four large kettles for boiling rice for use in field exercises, besides pans, pails, baskets, and other such things, they were borrowed from the Naval Store Depôt.

The rooms downstairs were appropriated to the use of the medical officer, for a nurses' room, an operating room, a dispensary, rooms for cooks and hired helpers, a pantry, a canteen, etc.

Communication by sea was kept up periodically, there being eight runs a day for the conveyance of supplies of necessary articles of provision, clothing etc.

There was, besides, an urgent necessity of providing water-closets, bathrooms, etc.

On June 6, however, telegraphic instruction was received from Saneyoshi, Chief of the Bureau of Medical Affairs to the effect that the Yokosuka Naval Hospital had room enough to receive more patients, and that we had better take steps to close our temporary accommodation in the storehouses for the reserve vessels as soon as possible.

Almost at the same time the Hospital Ship *Saikio Maru* entered the port and 64 of our patients were put on board her. On the morning of June 9; the others were removed to the Torpedo Division barracks.

The temporary sick-rooms in the storehouse for reserve ships were thus closed after having been open for only seven days.

The following composed the medical corps engaged on the work :—

Medical Officers	3	Sick Berth Steward.....	2	Servant	1
{ Fleet Surgeon.....	1	Sick Berth attendants..	5	Cooks (hired).....	5
{ Staff Surgeon	1	Ship's Cook	1		
{ Surgeon	1	Hired Attendants.....	7		
{ Probationary As-		Office-boy	1		
{ sistant Surgeon	1				
Apothecary	1	Labourers(permanently			
Assistant Apothecary		engaged)	2		
(1st Class).....	1				

Temporary Sick-Room in the Naval Court Martial Building.—The Naval Court Martial Building, standing close to the hospital, was considered to be a most appropriate selection from its past record of having once before been converted temporarily into sick-rooms in the war of 1894-5. Preparations were set on foot on June 2 to have it ready for the reception of patients, the sick berth attendants and hired men being encouraged to work all night. On the next day (3rd), a general cleaning was carried out with the assistance of men from the Naval Barracks and Torpedo Divisions, followed afterwards by the transportation of drugs, medical instruments, provisions, beds, etc. And on the following day (4th), patients were admitted.

The rooms converted into sick-chambers were 10 in number and could receive 63 patients, besides medical officers' room, dressing-room, nurses' room, etc. The size of the rooms varied much, but the smallest room, admitting of only one patients, was not less than 33 cubic metre in capacity.

The medical corps posted for the time being was as follows:—

Medical Officer, Staff Surgeon.....1	Head Nurse (Relief Party) 1
Medical Officer of Red Cross Relief Party..... 1	Nurses (Relief Party) .....10
	Workman (permanently engaged)... 1
Clerk (Relief party) 1	Servant 1

Patients limited to medical and eye cases were received on the 4th June, 28 from the hospital and 16 from *Kobe Maru*. Also from the 5th to the 10th Vice-Admiral Misu remained under treatment in this hospital. The number of patients that remained all the time it was open was from 40 to 50. On the 5th of December all the patients were transferred to the hospital proper and the rooms were closed after having been open for 185 days.

Temporary Ward No. 2 in the Torpedo Division:—On June 1, a telegram was received from the Hospital Ship *Kobe Maru* that she is bringing us about 200 patients. It happened to be just about the time that our Divisions were being

recruited; and, as was the case in every other year, it was anticipated that some among the recruits would have to be sent to the hospital. We felt therefore that we were by no means able to accommodate so large a number. It was decided that a temporary ward should be opened in the Torpedo Division barracks in addition to the one already existing there; and a store house of that Division being appropriated to this purpose, it was opened under the name of Temporary Ward No. 2. This was capable of receiving 42 patients.

On the morning of June 2, 37 cases of scabies from among recruits were admitted. The store-house, standing by the sea-side, was airy and well ventilated and had open places all around for the patients to take exercise in: but the interior was rather too small, not allowing even of dining tables to be placed in a row; so that tents had to be pitched for dining purposes on the ground at the back, wherein to take dinner. Also to an old water-closet was annexed a bath-room.

The staff posted for this work was as follows:—

Medical Officer	1	Sick Berth Attendants	2	Hired Cooks.....	4
(Fleet surgeon holding the post in addition to his own.)		Hired Attendants	6		
		Workmen	2		
Ward-Master	1	(regularly engaged)			

This temporary ward was opened on June 2 and closed on the 16th.

Kusuho Maru Sick Berths.—On the 4th of June, the *Kusuho Maru* (captured Hospital Ship *Orel*) arrived at Kure from Sasebo. The sentence pronounced by the Sasebo Prize Court in regard to this ship had been protested against, and the case was still under appeal; but the rights of ownership for the time being lay with us, and the ship had therefore been placed in the custody of the Kure Naval Station. We therefore decided to use her for our patients as she lay moored.

The interior of the ship was yet in disorder, in a state of general uncleanness; and we were not perfectly free from doubt as to whether she had ever had infectious patients on board during her long voyage. So it was considered necessary to effect a general disinfection. On July 7 Staff Surgeon Kajiu-

ra with a ward-master, and 11 sick berths stewards and attendants under him set out for the work.

On the 25th preparation was commenced for the equipment of the sick berth by employing 20 men of the sick berth staff (attached to the hospital) and 50 men of the executive branch. Medical stores and provisions were carried on board, the water-closets were repaired, new slop-sinks in the kitchen and water-pipes in the dispensary were put up. And as the Russian boilers were not good for boiling rice, a tent was pitched in the yard of the Direction of Accounts and Supplies for a kitchen.

On account, however, of the difficulty of carrying food etc. on board in rough weather, the three Russian boilers were removed and in their place a brick kitchen range in Japanese style was erected.

The hospital ship was fully provided with bed-clothes for an estimated number of 200 patients. The sick ward originally marked No. 3 was made No. 1; and the Nos. 5, 6, and 7 were made Nos. 2, 3, and 4. The chief mates' room on upper deck starboard side into an oto-rhino-laryngologic consultation room. The captains' cabin and the old No. 9 sick ward were made into an amusement and reception room for officers and men. When sick berths were double shelved, the upper berths were not to be used unless necessary.

The mooring place of the ship was fixed somewhere near the breakwater of the Port Office. She was moored by all fours and placed so as to be accessible in five minutes by steam-launch from landing place No. 1. Communication with the land was kept up by a hired boat and a steam-launch originally belonging to the *Orel*; and communication by telephone was introduced. On July 29, when the temporary wards in the Torpedo Division were closed, the patients there were transferred into this hospital ship.

The medical corps posted, so long as the hospital ship was in use, were as shown below :

Medical Officers	4	Probationary Assistant	Assistant Apothecary (1st
Fleet Surgeon.....	1	Surgeon	1 class)..... 1
Staff Surgeon	2	Apothecary.....	1 Sick Perth Stewards .. 2

Ship's Steward	1	Servant	1	Hired Cooks	7
Sick Berth Attendants...	5	Office-Boy	1		
Hired Nurses	8	Workmen	2		
		(regularly engaged)			

The number of patients received on board, after the admission of 70 on July 29, was over 130 per day on an average, and the number of days activity until the closure on December. 18, 1905, after the restoration of peace, was 143 days.

Establishment of Ordinary and Infectious Ward Pavilions.—The whole of the ward-pavilions having been damaged by earthquake, their repairs, beginning on April 15 and completed on December 22, 1905 were defrayed out of the current expenses.

The ordinary pavilion is a two-storied wooden building of 142.75 *tsubo* in area. It comprises 1 large room for 28 patients, 6 small rooms for 1 patient each and rooms for 2 patients, the upper and lower stories, together, thus containing 70 beds in all. There is a day-room in either story; and all rooms are lighted with electric lamps numbering altogether 31.

The infectious pavilion is also a two-storied wooden building of 125 *tsubo* in extent, containing six large rooms of 4 beds and 9 small rooms of one bed, capable of accommodating 33 patients in all. There is a passage on the north side, both in the upper and the lower story and a day-room at the eastern corner. These are lighted with electric lamps, numbering 32 altogether.

Re-building of the Two Old Wards.—The two original brickbuilt wards having been ruined by earthquake were re-built of wood in two stories, each covering an area of 141.93 *tsubo*.

II. Supply of Medical Stores.

At the beginning of the year 1904, before the opening of hostilities, medical stores were supplied to the ships, *Fuji*, *Yashima*, *Asama*, *Takachiho*, *Takasago*, *Naniwa*, *Itsukushima*, *Tsushima*, *Akitsushima*, *Akashi*, *Yamato*, *Tenryu*, *Akagi*, *Tsukushi*, *Saiyen*, as also to the Hospital Ship *Kobe Maru* and the Special-Service Ships *Tainan Maru*, *Taro Maru* and *Taichu Maru*.

For the Hospital Ship *Saikio Maru*, fitted out soon after the commencement

of the war, a new supply was bought and furnished. The supply required for the two hospital ships being naturally one of large dimensions, the business of attending to it was very important.

Indeed, during the year 1904, the medical service had all it could do to fill up the deficiencies on board the various ships going out to action, or to make good for the fresh supplies which the ships registered at Kure had got from the Sascho Medical Depôt. But later on in the year 1905, supply was made for the first time to such ships as *Yawata Maru*, *Sado Maru*, *Manshu Maru*, *Bingo Maru*, *Ryojun Maru*, *Shinano Maru*, and the destroyers *Fubuki*, *Kasumi*, *Ushio*, *Nenohi*, as well as to the Naval Briquette Manufactory temporarily established.

In the month of June when the earthquake occurred, the storehouses sustained much damage. The medical stores lost and damaged amounted in value to *yen* 3,610.35 for standing stock, *yen* 1,398.623 for articles for consumption, and *yen* 2,910.391 for drugs, making altogether *yen* 7,919.364, which were quickly made good.

Then the captured Hospital Ship *Orel* arrived and her medical stores were landed and delivered to us, amounting to 115 pieces of standing stock (value estimated at *yen* 1,778.15); 17 pieces of consumption stores (valued at *yen* 2,285.64) and 18 pieces of drugs (valued at *yen* 312.749), making altogether *yen* 4,376.539.

About the time of the conclusion of peace, the following special service ships were dismantled at Kure—*Shinano Maru*, *Sado Maru*, *Bingo Maru*, *America Maru*, *Ryojun Maru*, *Kobe Maru*, *Fukuoka Maru*, *Yawata Maru*, *Daichu Maru*, etc. The medical stocks they had on board were returned and received by us, which made the business of the Medical Depôt here very active as compared with the preceding year.

As to the common articles for the use of patients, it was made the principal business of the Medical Depôt to keep an additional supply in store within the limit of 270 bedsteads and their belongings, besides steam-boilers for kitchens, water-boilers, sterilizers and steam laundry machines, as well as boilers for the supply of steam to various parts of the hospital. Although most of these came

under the head of additional equipments during the war time. They were provided out of the current expenses of the hospital.

The disbursements made from February 6, 1904 to October 16, 1905, as expenses for patients, run as below :—

	Extraordinary Ex- penditure and Extra- ordinary War Expenses	Current Ex- penses	Total
Medical Stores	32,325.707	22,512.719	54,838.426
Standing	16,631.574	11,030.835	27,662.409
Consumptive.....	15,694.133	11,481.884	27,176.017
Drugs	9,638.767	10,657.887	20,296.654
Safe-keeping and Transportation of Same	2,645.740	2,823.879	5,469.619
Salaries and Wages	1,731.810	2,470.257	4,202.067
Utensils and Instruments.....	—	6.700	6.700
Sundry Articles.....	260.300	308.442	568.742
Portage	653.630	38.480	692.110
Ward Expense.....	16,055.005	15,562.410	31,617.415
Salaries and Wages.....	2,128.080	1,816.720	3,944.800
Utensils and Instruments	10,563.025	9,378.600	19,941.625
Books and Papers	—	—	—
Writing Brushes, Ink-sticks & Stamping Ink	—	16.020	16.020
Coal, Fuel, Oil	2,741.900	2,463.830	5,205.730
Sundry Articles	501.940	623.640	1,125.580
Electric Light	120.060	1,263.600	1,383.660
Expenses of Preventive Disin- fection.....	42.300	334.000	376.300
Expenses of Entrusted Patients.	795.085	135.880	930.965
Total	61,502.604	52,026.775	113,529.379

Again, the disbursement made for stores purchased before the outbreak of hostilities and consumed during the war, together with those made out of Extraordinary War Expenses after October 17, 1905, stand as follows :—

Medical Stores	2,111.425
Standing	405.810
Consumptive	1,705.615
Drugs	372.976
Safe-keeping and Portage	645.730
Salaries and Wages	477.050
Utensils and Instruments	78.620
Sundries	7.200
Portage	82.860
Ward Expense ..	2,404.840
Salaries and Wages	455.390
Utensils and Instruments.....	709.300
Books and Papers.....	1.500
Writing Brushes and Ink.....	8.820
Coal, Fuel, Oil.....	1,056.000
Sundries	173.830
Electric Light.....	—
Disinfecting Expenses.....	—
Expense for Entrusted Patients.....	—
Total	5,534.971

III. The Medical Organization.

1. The Medical Staff and Hired Nurses.

The staff consisted of the following :—

Director.....	Surgeon-General or Surgeon Inspector.....	1
	Surgeon-General K. Suzuki, afterwards on January 7th, 1905, replaced by Surgeon Inspector S. Yoshimura.	
Assistant } Director }	.....Surgeon Inspector or Fleet Surgeon.....	1
	Surgeon Inspector S. Yoshimura, afterwards replaced by Fleet Surgeon S. Ishihara.	
	Fleet or Staff Surgeons.....	3

Surgeons	5
Chief Apothecary and Apothecary.....	2
Manager of Medical Dépôt.....Chief Apothecary 2nd class, or Apothecary	1
Apothecary in charge of Sanitary Examination Laboratory.....	
Chief Apothecary or Apothecary	1
Member of the same.....Chief Apothecary, 2nd class, or Apo- thecary	1

Sick Berth Staff.—The Training Institute for Sick Berth Staff, was dissolved on December 26, 1903; and those pupils of the A and B classes, 10 in all, who had not completed the course, were sent to the Naval Barracks at Kure. This was the first dispatch of nursing hands. Afterwards as fleet auxiliaries in special service increased in number, many of the regular staff of the hospital were sent out to various ships; e. g. when the hospital ships, *Kobe Maru*, and *Saikio Maru*, were fitted out, 2 sick berth stewards and 9 attendants were ordered to the *Kobe Maru*, and 3 sick berth stewards and 10 attendants to the *Saikio Maru*. The consequence was, the nursing force present at the hospital on February 27 was reduced to 32 hands, which compared with the ordinary staff of 58 was a reduction by 26. Despite of all this, patients were twice transferred to this hospital from Sasebo to the number of 301; and the number of patients was thus increased to twice its ordinary size. A great want was then felt in the nursing force. We therefore lost no time in engaging hired nurses, and set to work training them with all possible haste in order to meet the pressing demand.

On the 16th April, a supplementary force arrived from Yokosuka Naval Hospital. The aggregate number present during the time from the opening of the war to the end in December was altogether 8,754. This in proportion to the aggregate patients, is 11.4 percent, with an average of 26 per day, being just half the number usual in times of peace. Consequently the business they attended to was brisk to an extreme.

Hired Nurses.—The first time nurses were hired at the Kure Naval Hospital was January 23, 1904, when 8 nurses were engaged for 50 *sen* per day

each, besides board and additional allowances during war time. Afterwards whenever any vacancy arose in the nursing force, hired men were called in, until the total number employed during the year 1904 aggregated 8,855 day's labour with wages amounting to *yen* 5,671.85.

After the opening of hostilities on February 6, 1904, another class of nurses was hired within the limit of twenty out of the Patients' Expenses, in addition to the afore said supplementary hired nurses, and such continued to be employed at the same rate of wages as the regular supplementary hired nurses. It was expected that such hired nurses would increase in number according as the number of patients increased, and they would have done so had it not been for the Red Cross Relief Party No. 24 dispatched on November 21, 1904. The arrival of this party put an end to the hiring of nurses out of Patients' Expenses. The aggregate number of days' employment from their first engagement until their abolition was 5, 4, 7, and the wages paid amounted to *yen* 2,967.98.

The above two sets of hired nurses were chosen by examination, those being selected who possessed a certain knowledge of the art. These were then put under a teacher so that they might be better instructed in their art; while at the same time they were ordered to attend the various sick-wards and pavilions to receive practical training.

At the time when the hospital ships were fitted out, these hired attendants under training were sent on board, 19 of them to the *Kobe Maru* and 12 to the *Saikio Maru*. Henceforward it was a rule, whenever any vacancy occurred in the ships entering the port, to meet it by selecting some of the men in employment at the hospital.

As we found it necessary that the hired nurses should wear a uniform working rig while at work, it was decided after due negotiation with the Direction of Accounts and Supplies at the Station, that two suits of working rig with blanket, etc.—the same as for the regular sick berth staff should be served out to them, and that they were to have the same board, should live in the hospital, keep night watch, etc. and work exactly in the same way as regular men of the Navy.

Hired men.—The press of business at the hospital after the outbreak of the

war necessitated the augmentation of the number of employes and hired men. On February 13, we set about engaging them; and when the hospital ships were fitted out, some of the men attached to the hospital were chosen and sent to serve on them viz:—1 instrument repairer, 3 washermen and 2 cooks, for the *Kobe Maru* and 1 instrument repairer, 2 washermen, 1 cook for the *Saikio Maru*.

The following will show the regular number employed in the hospital in ordinary times and the addition made during the war. Besides the above, the men employed as occasion required for the transference of patients from transports, and hospital ships, or for carrying medical stores, numbered altogether 363:—

Name	Regular No. Ordinary time .	Additional No. War time
Porters.....	2.....	0
Office-boys	2.....	2
Instrument Repairers	2.....	1
Washermen	5.....	3
Clerks	2.....	2
Regular Labourers	3.....	4
Engine-men	0.....	2
Servants	2.....	2
Cooks	8.....	6
Warehousemen.....	5.....	2

The wages paid to the additional men in the above list with their additional allowance during the war time amounted altogether to *yen* 3,178.726 for the year 1904; and those paid to the coolies specially employed came to *yen* 402.80.

All the members of the sick berth staff who were ordered not to go ashore except on duty on February, 2, were granted shore leave from the 22nd of the same month, while all other officers and employes were detained in the office two hours later than at ordinary times—Sundays and holidays not excepted; and whenever necessary, all the members of the hospital remained on duty even at night.

The sick berth staff and hired men for the year 1905 were as follows ;—

Sick Berth Stewards and Attendants.—At the time of the organization of the fleet and fleet auxiliaries on a special war footing, the distribution and supply of the sick berth staff was made from the hospital staff, whose regular numbers were much reduced in consequence, as stated elsewhere, that is to say, the numbers present on the 16th of October were 11 stewards and 25 attendants, making 36 in all, a deficit of 22 on their regular peace time staff.

Thus the nursing force was sadly short-handed the whole time. In spite of all the zealous assistance rendered by the Red Cross Relief Party, and the supplementary hired nurses, the press of business, always great in time of war, and made greater by the occurrence of a ruinous earthquake, e. g. at the time when temporary sick-rooms were being hastily provided outside the hospital, was truly indescribable ; but our petty officers and men attended to their duty with perfect devotion and eagerness.

Hired Attendants.—Whenever any vacancy occurred in the regular nursing staff, the gap was filled up with hired nurses. They were taught, during the first three months of their engagement, easy lessons in the art of nursing as well as practical work in the wards. An examination was held at the end of the term.

Employés and Hired Hands other than Nurses.—After the battle of the Japan Sea, the patients rapidly increased in number. At the time of providing temporary sick-rooms in several places outside the hospital, the number of men in regular employment was found deficient, and an increase was made in their number, as shown below :—

Name	Regular No. Ordinary time	Additional No. War time
Porters	2.....	0
Clerks	2.....	10
Servants	2.....	3
Office boys	2.....	3
Regular Labourers	3.....	2
Cooks	8.....	12

Name	Regular No. Ordinary time	Additional No. War time
Instruments-Repairs	2	1
Enginemen	2	3
Warehousemen	5	2
Washermen	5	3

2. Red Cross Society's Relief Party.

The Red Cross Relief Parties dispatched to the Kure Naval Hospital were two—the 24th Special Relief Party (composed of nurses from the Tokyo Charity Hospital), which arrived here on November 21, 1904, and the 37th Relief Party which came here on May 3 of the following year. Each party was composed of 2 medical officers, 1 pharmacist, 1 clerk, 2 head nurses, and 20 nurses, consisting altogether of 26 members.

The medical officers were placed under the naval medical officers of the hospital and the pharmacist under the naval apothecaries, and gave help in the medical and dispensary work. The clerks worked in the hospital office in the morning, and in the afternoon remained in their lodgings attending to the business of the party. The head nurse and the nurses under them were divided into two sections and set to work in the wards—4 of them keeping a night watch, and remaining on duty one day and one night at a time. The others were kept at work in the wards. They were also made to attend by turns in the operation-room. The 24th Party left the hospital on October 20; and the 37th party on December 15, 1905.

The statistics of their service in the hospital and the particulars of their board, etc., being the same as have been given under the heading of the Sasebo Naval Hospital, are omitted here.

IV. Admission of Patients.

How Admitted.—The Kure Naval Hospital not being favourably situated for immediate reception of the wounded patients from the front, most of the patients

received were such as had been transferred from the Sasebo Naval Hospital ; only a few were received directly from the hospital ships.

The following will show in what manner the patients were received into the hospital :—

1. A hospital or other ship of the fleet carrying wounded patients for the hospital had to display a signal below the hospital flag, notifying the number of such patients to the watch-house near the Naval Port.

2. On the receipt of such notice, the watchman immediately communicated with the Port Office and the Naval Hospital.

3. Such ships or boats on entering the port had again to announce by signal flag that they carried patients for the hospital.

4. Then the Port Office at once notified the Naval Station and the hospital by telephone.

5. Immediately on receipt of the notice, a party of stretcher-bearers was dispatched from the hospital to the boat for the reception and transportation of such patients.

N. B. Boats for this purpose were kept ready at the Port Office.

6. The stretcher-bearers were organized into parties carrying five stretchers each, and four such parties formed a body. Two of the parties were each under a medical officer with a sick berth steward and an attendant, while the other two parties were each under a sick berth steward with an attendant.

7. To receive the patients two parties of stretcher-bearers were sent to each boat carrying sick and wounded. The boats connected the ship with the landing-place (landing-place No. 1) and conveyed the patients. When landed, the patients were carried by parties of stretcher-bearers and ambulance wagons, two of each, going to and fro, between the landing-place and the hospital.

In-Patients.—The aggregate patients received into the hospital numbered 2,902, the number of each day's patients extending over the whole period being 159,066 with an average of 256.97 per day. The number of recoveries was 2,043, the number of cases transferred to other hospitals, 163, the invalided 398, deaths 46, remaining in hospital 252.

1. TABLE SHOWING THE NUMBER OF PATIENTS AMONG ENLISTED MEN OF THE NAVY WITH THEIR DISEASES CLASSIFIED.

Disease or Injury	Total Admission	Recovery	Removed to other Hospitals	Died	Invalided	Patients Remaining
General Diseases	131	103	8	3	11	6
Diseases of the Nervous System ...	72	44	4	1	19	4
Diseases of the Respiratory System...	363	125	35	7	177	19
Diseases of the Circulatory System...	49	29	4	2	7	7
Diseases of the Digestive System...	179	132	16	3	15	13
Diseases of the Genito-Urinary System	62	58	3	—	—	1
Venereal Diseases	932	765	57	3	9	98
Diseases and Injuries of the Eye.....	75	41	4	—	25	5
Diseases and Injuries of the Ear ...	45	11	3	—	23	8
Diseases of the Skin and Connective Tissue	123	113	3	1	2	4
Diseases of the Organs of Locomotion	54	24	7	3	15	5
Injuries	254	161	16	—	59	18
Injuries in Actual Battle.....	136	85	2	—	36	13
Sundries	1	—	—	—	—	1
Total.....	2,476	1,691	162	23	398	202

N. B. The total number of days' sickness was 139,965, average days' sickness per case 56.53. The above figures comprise 32 officers and warrant officers.

2. TABLE SHOWING THE NUMBER OF PATIENTS OTHER THAN ENLISTED MEN OF THE NAVY (Workmen, hired men &c.)

Disease or Injury	Total Admission	Recovery	Removed to other Hospital.	Died.	Patients Remaining.
General Diseases	16	15	—	1	—
Diseases of the Nervous System.....	10	10	—	—	—
Diseases of the Respiratory System...	9	8	—	1	—
Diseases of the Circulatory System...	2	2	—	—	—
Diseases of the Digestive System...	4	2	—	2	—

Disease or Injury	Total Admission	Recovery	Removed to other hospital.	Died.	Patients Remaining.
Diseases of the Genito-Urinary System	2	2	—	—	—
Venereal Diseases	2	2	—	—	—
Diseases and Injuries of the Eye.....	49	41	—	—	8
Diseases and Injuries of the Ear.....	1	—	—	—	1
Diseases of the Skin and Connective Tissue	2	2	—	—	—
Diseases of the Organs of Locomotion	5	5	—	—	—
Injuries	324	263	1	19	41
Total	426	352	1	23	50

N. B. The total number of days' sickness was 19,101, and the average days' sickness per case 44.81.

V. Out-Patients.

The out-patients during the war were 308 in number—128 petty officers and men, and 177 employés.

VI. Number of Surgical Operations.

The principal surgical operations performed during the present war, and their results are as shown below :—

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result			
		less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment discontinued
Neurectasy (ulnar nerve)	1	—	—	—	—	1	1	—	—	—
Paracentesis Thoracis (pleuritis)	5	—	—	1	1	3	2	1	—	2

Removal of Nasal Polypi.....	2	—	—	2	—	—	2	—	—	—
Removal of Cervical Lymphatic Glands	14	—	—	3	4	7	8	3	—	3
Incision and Scraping of Cervical Glands	11	—	—	—	4	7	7	1	—	3
Removal of the Axillar Glands.....	4	—	1	1	2	—	3	1	—	—
Incision and Scraping of Axillar Glands	9	—	—	1	4	4	4	2	—	3
Incision of Lymphatic Vessels.....	3	—	1	—	—	2	1	—	1	1
Removal of Inguinal Glands.....	1	—	—	—	—	1	1	—	—	—
Radical Treatment of Inguinal Hernia	13	—	—	3	8	2	11	—	—	2
Incision and Scraping of Fistula in Ano	16	—	—	1	6	9	8	5	—	3
Excision of Piles.....	8	—	—	1	3	4	5	2	—	1
Cauterization of Piles with a Paquelin Cantery	21	1	2	3	11	4	13	4	—	4
Cauterization of Prolapsus Ani with a Paquelin Cantery	3	—	—	—	1	2	2	1	—	—
Incision of Rectal Abscess	12	1	1	1	2	7	6	2	1	3
Tonsillotomy	1	—	—	—	1	—	1	—	—	—
Plastic Operation of Lip...	1	—	—	—	1	—	—	1	—	—
Urethrotomy	1	—	—	—	—	1	1	—	—	—
Plastic Operation of Urethra	1	—	—	—	—	1	1	—	—	—
Incision of Scrotum.....	1	—	—	—	1	—	1	—	—	—
Castration (or orchotomy)	2	—	—	1	1	—	1	—	—	1
Operation for Phimosis ...	4	—	—	1	1	2	4	—	—	—
Puncture of Hydrocele (tapping of the testis) .	2	—	—	—	—	2	1	1	—	—

Name and Character of Operation.	No. of Cases	Duration of Treatment after Operation					Result			
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment discontinued
Radical Operation of Hydrocele Testis.....	3	1	—	—	1	1	2	1	—	—
Enucleation of Inguinal Bubo. (venereal).										
Wounds totally closed	61	2	5	8	32	14	51	—	—	10
Wounds half open ...	204	4	1	16	93	90	172	3	1	28
With open Wounds...	54	—	—	4	16	34	49	4	1	—
Incision and Scraping of Bubo Inguinalis (venereal)	95	—	—	9	46	40	73	9	1	12
Aspiration of Suppurated Bubo Inguinalis (venereal)	1	—	—	1	—	—	—	1	—	—
Enucleation of the Eye ...	3	—	1	1	—	1	3	—	—	—
Evisceration of the Eye...	11	—	1	1	5	4	9	1	—	1
Extraction of Cataract.....	3	—	—	—	1	2	2	1	—	—
Removal of Pterygium.....	2	—	—	1	1	—	2	—	—	—
Puncture of the Cornea (tapping)	1	—	—	1	—	—	—	1	—	—
Iridectomy	2	—	1	—	—	1	—	1	—	1
Incision of Abscesses	41	1	5	9	10	16	25	4	—	12
Incision of Phlegmon	5	—	—	—	3	2	5	—	—	—
Incision for Caries of Bones	9	—	2	1	2	4	1	2	—	6

Incision for Periostitis ...	6	—	—	1	1	4	4	—	—	2
Incision of Joints (arthritis)	4	—	—	—	1	3	2	1	1	—
Forcible Correction of Ankylosis.....	5	—	—	1	—	4	1	3	—	1
Reduction of Dislocation of Vertebral Bones	1	—	—	—	—	1	—	—	—	1
Extraction of Shell Fragments	3	—	—	1	—	2	3	—	—	—
Incision of Gunshot Wound	7	—	—	2	3	2	5	1	—	1
Reduction of the Fracture	29	2	—	3	12	12	15	5	—	9
Incision of the Contusion	1	1	—	—	—	—	—	—	—	1
Incision of the Contused Wound	10	—	—	3	4	3	8	—	—	2
Suturing of Contused Wound	7	1	1	1	—	4	5	—	—	2
Resection of Bone, at the Fractured end.....	8	—	1	—	3	4	6	—	—	2
Resection of Bone protruding in the Wounds	3	—	1	—	2	—	1	1	—	1
Amputation at the Elbow...	2	—	—	—	—	2	1	—	—	1
Amputation through the Knee Joint.....	2	—	—	—	—	2	1	1	—	—
Amputation of the Phalanx of Toe.....	5	—	—	2	2	1	4	1	—	—
Amputation of the Tarsal Bone	1	—	—	—	—	1	1	—	—	—
Amputation of the Phalanx of Fingers	7	—	1	—	2	4	5	1	—	1
Resection of Rib	4	—	—	1	2	1	1	1	—	2
Amputation at the Wrist Joint	1	—	—	—	1	—	1	—	—	—
Amputation at the Ankle Joint	1	—	—	—	—	1	1	—	—	—
Amputation at the Shoulder Joint	1	—	—	—	—	1	—	1	—	—

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result			
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment discontinued
Trepanation (trephining the skull)	2	—	—	—	—	2	2	—	—	—
Extraction of Fragments of Bones of the Skull.....	4	—	—	—	3	1	4	—	—	—
Extraction of Fragments of Bones in the Compound Fractures	2	1	—	—	—	1	1	—	1	—
Disarticulation	2	—	—	—	1	1	2	—	—	—
Enterostomy	2	1	—	—	—	1	1	—	1	—
Laparotomy	2	1	—	—	—	1	1	—	1	—
Incision of Gunshot Wound and Extraction of Foreign Bodies and Bone Fragments there from ...	5	—	—	1	2	2	4	—	—	1
Perineotomy	1	—	—	—	—	1	—	—	—	1
Silver Suture of Fractured Inferior Maxillary Bone	1	—	—	—	1	—	1	—	—	—
Skin Grafting	15	—	2	5	4	4	6	2	—	7
Total	775	17	27	92	305	334	565	70	9	131

VII. Laboratory Work.

The number of tests and examinations made during a period of 1 year and 9 months, from February 1904 to October 1905, was 2,407, of which 667 cases on drugs, 835 on surgical stocks, 741 on articles of food, 14 on table utensils and other articles of necessity, besides 1 forensic-chemical experiment and 149 cases of general hygienic and other examinations. These distributed severally into the months ran as under :—

Month	Medical Stores	Surgical Stores	Victuals	Table Ware and other Supplies	Forensic Chemical Test	Hygienic Examination in General and Sundries	Total
February 1904 ...	58	41	36	—	—	2	137
March „	65	74	45	6	—	1	191
April „	9	16	35	—	—	1	61
May „	15	32	35	—	—	15	97
June „	15	4	30	—	—	4	53
July „	79	109	33	—	—	8	229
August „	31	47	32	—	—	1	111
September „	37	143	31	—	—	—	211
October „	17	31	32	—	—	10	90
November „	11	37	34	—	1	26	109
December „	54	80	37	—	—	4	175
January 1905 ...	15	9	40	3	—	4	71
February „	34	12	46	—	—	8	100
March „	45	124	43	—	—	5	217
April „	17	12	33	—	—	4	66
May „	35	12	34	—	—	9	90
June „	17	5	32	—	—	4	58
July „	14	16	34	—	—	8	72
August „	12	11	36	—	—	12	71
September „	49	5	31	5	—	13	103
October „	38	15	32	—	—	10	95
General Total...	667	835	741	14	1	149	2,407

Of the above tests and examinations, those done on drugs, medical stocks, articles of food, table utensils and other necessities were all prosecuted at the time of their purchase in order to ascertain their quality. Rules of testing and such other matters are exactly the same as at ordinary times. So also with other examinations, hygienic or otherwise. The only difference lies in the number of cases—the number at ordinary time averaging from 70 to 80 per month and increasing in war time to 114.6.

SECTION IV. YOKOSUKA NAVAL HOSPITAL.

I. Preparation for the Admission of Patients.

Proper Ward Pavilions.—The proper ward-pavilions of the hospital are seven wooden buildings, only one of which is two-storied. The maximum capacities of the pavilions are 37 beds in the pavilion No. 1, 55 in No. 2, 60 in No. 3, 55 in No. 4, 47 in No. 5, 61 in No. 6, 3 in the lunatic ward making altogether 318 beds.

At the commencement of the war, the in-patients numbered only 120, leaving 190 beds unoccupied; and nothing was wanting in the way of equipments, excepting 100 incandescant lights in the wards and 3 arc-lamps in the garden, which were all fixed and erected in June, 1904. At the third period of the war, however, when the front line of battle extended as far as Sakhalin, the wounded patients sent home from that quarter were so many that the work of the hospital became very heavy. In July, 1905, the operation-room was freshly provided with a sterilizer for water, the same for dressing material, a lavatory and a stove; while an extension in the building, as shown below, was set on foot in August and finished in October:—

Places Extended	Building Area (<i>Tsubo</i>)	Began building	Finished
Bathroom of Operating Chamber	4	24th, Aug., 1905	17th, Sept., 1905
Pharmacy attached to Dispensary	3	10th, Oct., 1905	29th, Oct., 1905
Laundry	8	Do.	18th, Nov., 1905
Packing Place for Medical Dépôt	15	21st, Oct., 1905	9th Dec., 1905
Test-Room of Chemical Laboratory	5	10th, Oct., 1905	3rd Nov., 1905

Naval House used for Temporary Wards.—On August 30, 1905, the Hospital Ship *Saikio Maru* entered the Port of Yokosuka carrying 108 wounded patients from our Northern Fleet. Just at the time the hospital happened to be full, having 281 in-patients and no room was left for further admissions. Imme-

diately therefore, on receipt of the notice, it was decided that the Naval House should be converted into a temporary hospital. This was effected and the place was opened on the 31st of August. It was a two-storied house, with three rooms in the upper-story, and one downstairs, and was fitted up for the reception of 65 patients.

It was closed on the 20th of September, 1905, after having been kept open for 21 days.

The Katsuo-Kan used for Temporary Wards.—This was hastily done on September 20, 1905, on the closing of the Naval House as related above.

The Katsuo-Kan is a hotel built close by the sea-side, and standing in the village of Otsu in Miura-Gori. A part of this hotel, i.e. a large room upstairs in the main building, and a double-storied house facing the street, altogether covering an area of 77 *tsubo*, and capable of containing 80 patients, was converted into temporary wards, the work here continuing until after the restoration of peace.

II. Supply of Medical Stores.

The gradual augmentation of the supply of medical stores for our fleet and fleet auxiliaries had already begun in the earlier part of 1904. The number of supplies made during the period running from January 1904 to October, 1905, i.e. until the restoration of peace, stands as under:—

Month	Standing Stores	Consumable Stores	Drugs	Total
January 1904	179	321	516	1,016
February „	231	182	251	664
March „	56	42	52	150
April „	148	411	613	1,172
May „	98	70	109	277
June „	221	166	252	639
July „	30	22	23	75
August „	63	59	83	205
September,,	59	6	8	73

Month	Standing Stores	Consumable Stores	Drugs	Total
October 1904	31	38	64	133
November „	24	50	73	147
December „	148	184	248	580
January 1905	85	111	199	395
February „	80	160	225	465
March „	112	126	239	477
April „	57	641	1,047	1,745
May „	39	133	190	362
June „	34	51	69	154
July „	266	210	310	786
August „	114	144	191	449
September „	198	174	236	608
October „	78	122	138	338
General Total	2,351	3,423	5,136	10,910

Referring to the above list, the larger figures under January and February, 1904, are due to the absorption of medical stores for future provision by all the ships of the fleet and fleet-auxiliaries, and the same under December are owing to the temporary return of several ships in succession into the port. The excessive increase in April, 1904 and 1905, is due to the junction of the two fiscal years, in March and April. It was decided that converted cruisers, and five or six other ships on special service should have large medicine chests, (No. 1) etc., but several other things besides the regular supply were found necessary: such as, operating cases, eye cases (small), sterilizers for surgical instrument, cotton cloth for bandages, cotton floss, and drugs.

Besides the supply business above mentioned, various exchanges of articles on stock were made with the medical depôts of other hospitals. For instance, to the Sasebo Medical Depôt were entrusted over 200 articles, inclusive of standing stores, consumable articles, drugs, etc.

III. The Organization.

The Medical Staff consisted of the following :—

Director.....	Surgeon-General or Surgeon Inspector.....	1
Surgeon Inspector K. Yamamoto, promoted Surgeon-General on September 1st, 1904, replaced on June 24th by Surgeon Inspector T. Honda.		
Assistant Director.....	Surgeon Inspector or Fleet Surgeon.....	1
Surgeon Inspector T. Honda, on June 24th, 1905, replaced by Surgeon Inspector H. Ishikawa, who was also replaced on May 9th, 1905, by Fleet Surgeon H. Fujita.		
Fleet or Staff Surgeon		4
Surgeons		6
Chief Apothecary and Apothecary		2
(one being an additional post.)		
Manager of the Medical Dépôt.....	Chief Apothecary, 2nd class, or Apothecary	1
Apothecary in charge of the Sanitary Examination Laboratory.....		
Chief Apothecary or Apothecary		1
Member of the same.....	Chief Apothecary, 2nd class, or Apothecary	1

Sick Berth Staff:—In the year 1904, the nursing force was found to be six hands short, on February 6 ; and from April onwards it was gradually reduced in number until to prevent the interruption of medical treatment 2 nurses were hired to fill the gap for the first time on May 28, and then 8 more during the three months, July, August and September. By December when the regular force was reduced to below two-thirds of its regular strength, the hired nurses were better accustomed to their service so that no serious inconvenience was felt on that score.

Down to 1905 large deficiencies were constantly experienced in the nursing force. The regular number of hands (sixty) was reduced as low as 24 on active service, their places having each time been filled with hired nurses.

IV. Admission of Patients.

The manner of admitting patients into this hospital, being much the same as that used in other Naval Hospitals, requires no special mention here. The only difference was this: owing to the considerable distance between the Port Office and the hospital, dray carts were employed, whenever the patients for reception were particularly numerous, for conveying their effects.

The total number of patients admitted during the war, was 2,013, the total number of days' treatment extended over the whole period being 91,270 with an average of 147.68 per day. The results were 1,429 recovered, 1 transferred to another hospital, 167 invalided and 40 dead.

The wounded in action were 85 in number, their days' treatments numbered 7,446. The results were 39 recovered, 28 invalided, with a remnant of 18.

**TABLE SHOWING THE NUMBER OF PATIENTS AMONG
ENLISTED MEN OF THE NAVY.**

(From Feb. 2, 1904 to Oct. 16, 1905.)

Disease or Injury	Total Admis- sion.	Reco- very	Removal to other Hospi- tals	Invalid- ed	Died	Patients Remain- ing
General Diseases	149	116	—	8	10	15
Diseases of the Nervous System.....	78	51	—	9	1	17
Diseases of the Respiratory System...	423	230	—	88	13	92
Diseases of the Digestive System...	206	162	—	5	3	36
Diseases of the Circulatory System	38	31	—	1	3	3
Diseases of the Genito-Urinary System	43	28	—	4	—	11
Venereal Diseases.....	542	461	—	2	2	77
Diseases and Injuries of the Eye.....	67	41	—	2	—	24
Diseases and Injuries of the Ear.....	54	34	—	6	—	14
Diseases of the Skin and Connective Tissue	71	57	—	1	—	13
Diseases of the Organs of Locomotion	32	15	—	4	2	11

Injuries	127	79	—	9	2	37
Injuries in Actual Battle	85	39	—	28	—	18
Total.....	1,915	1,344	—	167	36	368

N.B. The total number of days' sickness is 87,360, average days' sickness per case 45.6. The above figures comprise 41 officers and warrant officers.

**TABLE SHOWING THE NUMBER OF PATIENTS OTHER THAN
ENLISTED MEN OF THE NAVY.**

(Feb. 6, 1904—Oct. 16, 1905).

Disease or Injury	Total Ad- mission	Recovery	Removal to other Hospitals	Died	Patients Remain- ing
General Diseases	16	14	—	1	1
Diseases of the Nervous System.....	5	3	1	1	—
Diseases of the Respiratory System...	6	3	—	1	2
Diseases of the Circulatory System...	1	1	—	—	—
Venereal Diseases	2	—	—	—	2
Diseases and Injuries of the Eye.....	7	6	—	—	1
Diseases of the Skin and Connective Tissue	2	1	—	—	1
Diseases of the Organs of Locomotion	3	3	—	—	—
Injuries	56	54	—	1	1
Total.....	96	85	1	4	8

N.B. The total number of days' sickness is 3,910, average days' sickness per case 39.89.

V. Out-Patients.

The out-patients during the war were all students of the Mercantile Marine School, and numbered altogether 114; no men of the Navy nor any member of their families were treated in the hospital.

VI. Number of Surgical Operations.

The principal surgical operations performed during the war were 151 in number; their results and terminations are as shown below:—

Name and Character of Operation	Number of Cases	Duration of Treatment after Operation					Result			Treatment Discontinued
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	
Electric Cauterization of Hypertrophic Rhinitis ...	2	—	—	—	1	1	1	1	—	—
Enucleation of Cervical Glands (tubercular lymphadenitis)	5	1	2	—	1	1	5	—	—	—
Incision of Cervical Glands...	3	—	—	1	1	1	2	1	—	—
Scleroticotomy.....	1	—	1	—	—	—	1	—	—	—
Enucleation of the Eye	2	—	1	—	1	—	1	1	—	—
Iridectomy	1	1	—	—	—	—	1	—	—	—
Excision of Piles	1	—	—	—	1	—	1	—	—	—
Cauterization of Piles	3	—	—	2	1	—	3	—	—	—
Incision and Scraping of Fistula in Ano.....	15	—	3	3	5	4	11	1	—	3
Incision of Incomplete Fistula in Ano	1	—	—	1	—	—	—	1	—	—
Varicocelelectomy	1	—	—	—	1	—	1	—	—	—
Incision of Phlegmon.....	1	—	—	—	—	1	1	—	—	—
Incision of Abscess.....	4	—	1	2	1	—	2	1	1	—
Extraction of Sequestrum (phalanx of finger)	1	—	—	—	1	—	—	1	—	—
Removal of Neuroma.....	1	—	—	—	1	—	—	1	—	—
Electric Cauterization of the Mucous Membrane of the Inferior Turbinate Bone...	3	1	1	—	1	—	2	1	—	—
Plastic Surgery of the Soft Palate.....	1	—	—	—	1	—	1	—	—	—
Amputations of the Forearm	1	—	—	—	1	—	—	1	—	—

Amputation at the Ankle...	1	—	—	—	—	1	1	—	—	—
Plastic Operation of the Finger	1	—	—	—	1	—	—	1	—	—
Radical Treatment of the Inguinal Hernia.....	5	1	1	1	2	—	5	—	—	—
Appendicectomy	4	—	—	2	2	—	3	1	—	—
Incision of the Abscess of Abdominal Transversalis Muscle	1	—	—	—	—	1	1	—	—	—
Incision of Hydrocele of the Spermatic Cord.....	1	—	1	—	—	—	1	—	—	—
Operation for Phymosis.....	3	—	—	1	2	—	3	—	—	—
Radical Operation of Hydro- cele Testis.....	2	—	1	1	—	—	2	—	—	—
Plastic Operation of Scrotum	1	—	—	—	—	1	1	—	—	—
Plastic Operation of Urethral Fistula	1	—	—	—	1	—	—	—	—	1
Enucleation of the Inguinal Bubo, Venereal	47	3	5	8	18	13	39	1	—	7
Incision and Scraping of In- guinal Bubo, Venereal.....	7	—	1	1	3	2	7	—	—	—
Removal of Sebaceous Cyst...	1	—	—	1	—	—	1	—	—	—
Thoracotomy	1	—	—	—	1	—	—	—	1	—
Incision of Fistula of Gluteal Region	1	—	—	—	—	1	1	—	—	—
Forcible Correction of Anky- losis, Hip and Knee-Joint	1	1	—	—	—	—	—	—	1	—
Incision of Periostitis of the Inferior Maxillary Bone, and Extraction of Seque- strum	1	—	—	—	—	1	—	—	—	1
Incision of Suppurative Myositis	2	—	—	—	1	1	2	—	—	—
Incision and Scraping of Abscess of Ilium.....	1	—	1	—	—	—	—	—	1	—
Amputation of Middle and Ring Fingers	5	—	1	—	3	1	4	1	—	—

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result			Treatment Discontinued
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	
Extraction of Foreign Bodies from Gunshot Wounds of the Leg.....	1	—	1	—	—	—	1	—	—	—
Foreible Correction of Ankylosis of Finger.....	1	—	—	—	—	1	—	—	—	1
Excision of Cicatrix from the Mutilated Wound of Foot	1	—	—	1	—	—	1	—	—	—
Plastic Operation of Lower Jaw deformed by Gunshot Wound	1	—	—	1	—	—	1	—	—	—
Resection of the Rib.....	2	—	—	—	2	—	1	—	—	1
Resection of the Bone of the Skull	1	—	—	—	1	—	—	—	1	—
Reduction of the Dislocation of Clavicle	1	—	—	—	1	—	—	—	—	1
Reduction of the Fracture of Clavicle	1	—	—	—	1	—	1	—	—	—
Interphalangeal Amputation of the Middle Finger.....	1	—	—	—	—	1	1	—	—	—
Amputation of the Little Finger	1	—	—	—	1	—	1	—	—	—
Reduction in the Compound Fracture of the Skull.....	2	—	—	—	1	1	2	—	—	—
Reduction of the Simple Fracture of Humerus.....	1	—	—	—	1	—	—	—	—	1
Incision of Gunshot Wound of Knee-Joint.....	1	—	—	—	—	1	1	—	—	—

Reduction in the Compound Fractures of Tibia and Fibula	2	--	—	—	1	1	2	—	—	—
Total	151	8	21	26	61	35	116	14	5	16

SECTION V. MAIDZURU NAVAL HOSPITAL.

I. Preparation for the Reception of the Wounded.

1. Sick-Rooms and General Repairs.

At the commencement of the naval war, the Maidzuru Naval Hospital had three pavilions for the reception of the sick, viz., ward pavilion No. 1, an infectious pavilion and a lunatic ward.

The full number of patients admissible being no more than 75, the following special wards were opened one after the other:—

Special Ward in the Torpedo Division Barracks.—This ward was opened on February, 29, 1904, for temporary purposes. Being originally a two-storied barrack built of wood, the part appropriated to the present purpose, i.e. two large rooms upstairs and one large room downstairs, covered an area of 183 *tsubo* and were capable of receiving 120 patients. In the beginning, the rooms upstairs only were employed; but in consequence of the arrival of the Hospital Ship *Saikio Maru*, with a large number of wounded patients on April 21, 1904, the room downstairs came suddenly into use. The small rooms at the western corner, both in the upper and the lower story, were made into a consulting room, and a nurses' waiting room, respectively; while a similar room at the eastern corner upstairs was used as a room for clothing and other stores. For kitchens, lavatories, and water-closets, half of those originally existing were employed. In the corner of the bathroom in the barrack, bath-tubs were placed for the use of patients. As for the dispensary, the one already existing was taken, medical stores being provided in small quantities only, on a calculation of the probable requirements of each day. Whatever other things were needed were supplied from the hospital as occasion arose. In winter, however, stoves for heating were placed in proper places.

This ward was closed on October 9, 1905, after having been kept open for 598 days.

Building of Two Ward Pavilions.—The two ward pavilions which were commenced on July 8, 1904, were finished on October 5, of the next year. Each is a two-storied wooden building, covering an area of 227. 5 *tsubo*. The upper story in each has one large room and six smaller ones, together capable of receiving 62 patients, as a regular limit. The rooms are heated with fixed stoves. Upon the roof stands an iron water boiler of about 3 tons in capacity, the water in it being boiled by steam and conducted through pipes to the surgical dressing room and to the lavatories in the wards.

The repairs made in the hospital consisted of a concrete facing of laboratories, a brick floor in part of the covered passages, mattings laid on the passages to the office, mending window-panes, etc.

II. Supply of Medical Stores.

At the beginning of the war, the Medical Dépôt of the hospital furnished a supply out of its own medical stores for the ships, *Kongo*, *Maya*, *Adzuma*, *Mikasa*, *Chitose*, *Hiyei*, *Idzumo*, *Tokiwa*, *Chinsei*, and destroyers *Harusame*, *Asashio*, etc. These vessels all had more or less of stores on board already; but they were freshly supplied in order that they might experience no lack of medical requirements. After this, we supplied from our Medical Dépôt the special ward and the Quarantine Station at Toshima with requisite medical stores and articles for the daily use of the patients. And further in reply to the requests made by Sasebo and Kure Naval Hospitals, some of our stores were sent thither as change of custody. Besides these, such purchases were made as of 100 bedsteads and their belongings for the use of patients.

Among the stock that changed custody there was, for instance, a steam-disinfector with boiler attached, which forwarded to Sasebo on April 18, 1904. The above had been kept in store at the hospital since 1903 with a view to the establishment some day of a Quarantine Establishment at Toshima. The circumstances of the time, however, rendered it necessary to establish the quarantine

station; and it was decided to defray the expenses thereof out of the Extraordinary War Allowance—the disinfecter and steam-boiler being paid for out of the building allowance, while for other requisites for patients as well as medical stock payment should be made out of the Extraordinary War Expenses for Patients.

III. The Organization.

The medical staff consisted of the following :—

Director.....	Surgeon-General or Surgeon Inspector	1
	Surgeon Inspector S. Tsuruta.	
Assistant }	Surgeon Inspector or Fleet Surgeon	1
Director }		
	Surgeon Inspector K. Ogisawa.	
	Fleet Surgeon and Staff Surgeon	3
	Surgeons	5
	Chief Apothecary and Apothecary	2
	(one being an additional post).	
	Manager of the Medical Dépôt.....	Chief Apothecary, 2nd
	class, or Apothecary	1
	Apothecary in charge of the Sanitary Examination Laboratory	
	.....	Chief Apothecary or Apothecary
	Member of the same, Chief Apothecary, 2nd class, or Apothe-	
	cary.....	1

Sick Berth Stewards and Attendants.—At the beginning of the year 1904 the total number present was 53. Afterwards, 18 of them having been sent to another quarter and 14 having come from other quarters, the number present at the end of December was 12 stewards and 37 attendants, making 49 in all. As a matter of fact the nursing force had necessarily been short-handed since the opening of hostilities, so that nurses had to be hired to make good for the deficit. The total number of hired nurses was 22, of whom 7 were dismissed, making the number present at the end of December only 15.

The nursing force for the year 1905, present on January 1, numbered 13 stewards and 36 attendants. These gradually decreased until the number present on October 16 was 11 stewards and 20 attendants. The hired nurses during the year 1905 numbered 39, while their number present on October 16 was 31.

Hired nurses were engaged to fill up the deficiencies in the regular nursing force. Applications were invited on December 18, 1903. The successful applicants, 12 in number, were distributed among the wards, where they were taught the first steps of nursing trained in the practice of their art. The manner of their service, etc., being the same as related under Sasebo Naval Hospital, is here omitted.

IV. Admission of Patients.

How admitted.—On the receipt of notice respecting the patients to be sent back from the front, the hospital communicated the same to the Port Office, stating the number of boats required according to the number of patients to be received. At the same time a receiving party of stretcher-bearers was formed and held in readiness for the ships' entry into harbour. As soon as notice came from the watch-house that the expected ship had come in sight, this party was dispatched in a transport boat to the predetermined place of anchorage; and as soon as the ship had cast anchor, they got aboard and proceeded at once to investigate the condition of the patients and their number. The patients were then transferred to the boat in regular order. On landing, those who are able to walk were made to go on foot, while the rest were carried on stretchers, their effects being transported on the carts specially provided. For purposes of transport Japanese junks (*temma*) were employed, with a boats' awning outspread for protection from sun, wind and rain.

In-Patients.—The present hospital being unfavourably situated for the immediate reception of wounded patients from the front, most of the patients received had been transferred from another hospital. The ones sent back directly from the front were from the Hospital Ship *Saikio Maru*, which entered the port only once, on April 21, 1904, carrying 89 patients. In the year 1905

our ships began returning from the front and the entry of captured ships, etc., immediately swelled our reception-roll of patients.

The total number of patients received during the war was 1,080, inclusive of prisoner invalids, the total number of days' treatment over the whole period being 57,380, which an average of 92.84 per day. Their statistics were 794 recovered, 124 invalided, 35 dead, remainder 127. The wounded in action received into the hospital numbered 83 (prisoner invalids not included).

**TABLE SHOWING THE NUMBER OF PATIENTS AMONG
ENLISTED MEN OF THE NAVY.**

(Feb. 6, 1904—Oct. 16, 1905).

Disease or Injury	Total Admis- sion	Reco- very	Removal to other Hospi- tals	Invalid- ed	Died	Patients Remain- ing
General Diseases	65	45	—	2	8	10
Diseases of the Nervous System ...	27	13	—	10	—	4
Diseases of the Respiratory System	163	84	—	45	13	21
Diseases of the Circulatory System	6	5	—	—	1	—
Diseases of the Digestive System	96	80	—	3	3	10
Diseases of the Genito-Urinary System	12	5	—	2	1	4
Venereal Diseases	269	245	—	4	1	19
Diseases and Injuries of the Eye...	16	13	—	1	—	2
Diseases and Injuries of the Ear	16	11	—	2	—	3
Disease of the Skin and Connective Tissue	43	35	—	2	—	6
Diseases of the Organs of Locomotion	23	11	—	3	1	8
Injuries	147	93	—	31	—	23
Injuries in Actual Battle	83	52	—	19	—	12
Total	966	692	—	124	28	122

N.B. The total number of days' sickness is 52,341, average days' sickness per case 54.2.

The above figures comprise 12 officers and warrant officers (exclusive of prisoners).

**TABLE SHOWING THE NUMBER OF PATIENTS OTHER THAN
ENLISTED MEN OF THE NAVY**

(Feb. 6, 1904—Oct., 16, 1905.)

Disease and Injury	Total Ad- mission.	Recovery	Removal to other Hospitals	Died	Patients Remain- ing.
General Diseases	1	1	—	—	—
Diseases of the Nervous System ...	1	1	—	—	—
Diseases of the Respiratory System	2	1	—	1	—
Diseases of the Digestive System...	3	3	—	—	—
Venereal Diseases	2	2	—	—	—
Diseases and Injuries of the Eye ...	2	2	—	—	—
Diseases of the Skin and Connective Tissue.....	2	2	—	—	—
Injuries	49	42	—	2	5
Total.....	62	54	—	3	5

N.B. The total number of days' sickness is 1,997 average days' sickness per case 32.21

V. Admission of Wounded and Sick Prisoners.

The wounded and sick from the war-ship *Ore!* captured in the battle of the Japan Sea were received into this hospital on May 30. Their number was 11 warrant officers and above, 41 petty officers and seamen.

These were admitted into the temporary pavilion, the officers on the upper story, and the others downstairs, where they were put under treatment. Most of the officers not only spoke either German or French, but many of them understood English, too; and one of them understood Japanese. With their petty officers and blue-jackets, none of whom possessed any knowledge of foreign tongues, some difficulty was experienced at first; but after a while interpreters were appointed, and no more inconvenience was felt in putting them under medical treatment. These men remained in the hospital until October 4—a period of 128 days. As to the treatment of their wounds, it has already been described

under Chap. III, Book III. The dietary arrangements were the same as those described under Sasebo Naval Hospital; so they are omitted here.

VI. Out-Patients.

The number of out-patients, from February 6, 1904 to October 16, 1905, was 246 men of the Navy, 122 civilians and 885 members of the families of the men at the front, making altogether 1,253.

VII. Number of Surgical Operations.

The principal surgical operations done during the campaign numbered 140 cases as shown below :—

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment Discontinued	
Removal of Nasal Polypi.	1	1	—	—	—	—	1	—	—	—	
Resection of Rib	1	—	1	—	1	—	—	—	1	—	
Emucleation of Cervical Glands.....	1	1	—	—	—	—	1	—	—	—	
Operation for Inguinal Hernia	1	1	—	—	—	—	1	—	—	—	
Laparotomy	2	1	1	—	—	—	—	—	2	—	
Incision of the Fistula in Ano	1	—	—	—	1	—	1	—	—	—	
Excision of Piles	6	1	—	1	3	1	4	2	—	—	
Emucleation of Inguinal Bubo, Venereal.....	54	5	3	5	24	17	54	—	—	—	
Incision of Inguinal Bubo, Venereal	36	—	3	6	14	13	36	—	—	—	
Puncture of Inguinal Bubo, Venereal	4	1	1	—	2	—	2	1	—	*1	*was again incised.
Incision of Abscess	7	—	1	1	1	4	7	—	—	—	

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment Discontinued	
Extirpation of Benign Tumor.....	3	2	—	1	—	—	3	—	—	—	Invalidated
Resection of Cicatrices.....	2	—	—	—	—	2	1	—	—	1†	
Suturing of Contused Wound	2	—	—	—	1	1	2	—	—	—	
Amputation of Fingers ...	5	—	3	1	1	—	4	—	—	1†	
Incision and Reduction of the Simple Fracture of the Femur.....	1	—	—	—	—	1	—	—	—	1†	
Operation for Phimosis ...	1	—	—	1	—	—	1	—	—	—	
Incision of the Iliac Fossa	1	—	—	—	—	1	—	—	—	1†	
Evisceration of the Eye ..	2	—	—	1	1	—	2	—	—	—	
Amputation of the Humerus (upper arm)	1	—	—	—	—	1	1	—	—	—	
Correction (forcible) of Elbow-Joint	1	—	—	—	—	1	1	—	—	—	
Amputation of the Forearm	1	—	1	—	—	—	1	—	—	—	
Amputation of the Thigh.	1	—	—	—	—	1	1	—	—	—	
Trepanation	2	1	—	—	—	1	—	1	1	—	
Sequestrotomy	1	—	—	1	—	—	1	—	—	—	
Extraction of Shell Fragments	2	—	—	—	2	—	1	1	—	—	
Total	140	14	14	18	50	44	126	5	4	5	

VIII. Toshima Quarantine Station.

This station was established at the cost of *yen* 29,965.332 out of the Extraordinary War Expense. Its erection was begun on July 18, 1904 and finished on March 15, 1905, and it covers an area of ground of 2,403.5 *tsubo*. It comprises the following different buildings:—

1. Medical Officers' Room with Water-Closet annexed.	39.50	<i>tsubo</i>
2. Isolation Barrack with Water-Closet annexed.....	81.50	do
3. Disinfection Department.....	28.00	do
4. Bath-Room and Water-Closet.....	6.75	do
5. Regular Labourers' Room	6.00	do
6. Kitchen	27.00	do
7. Infectious Barrack with attached Buildings	184.00	do
8. Destructor Furnace for Garbage.....	1.00	do
Total	373.75	do

The disinfection plant is the one received in exchange of custody from the Construction Section of the Direction and Supplies of Maidzuru Naval Station, and is valued at *yen* 7,872.

The disinfector is an autoclave, double-jacketed, and measuring 5 ft. 5/8 in., inner diameter, and 5 ft. 9. 3/4 in. outer-diameter. The steam pressure (both inner and outer jacket) is from 5 to 10 lb., and the water pressure 12 lb.

SECTION VI. TAKESHIKI SICK-QUARTERS.

I. Preparation for the Admission of the Wounded Patients.

At the outbreak of the hostilities the shipping at anchor within the Port of Takeshiki gradually increased in number; and in consequence a sudden augmentation was experienced in the number of patients entrusted to the station for medical treatment in its sick quarters. This entrusting of patients not being quite convenient in practice, it was deemed time to make an arrangement by which patients might be received from ships other than those under the Takeshiki Jurisdiction, in the same way as regular patients, just as in any Naval Hospital. With this object in view Vice-Admiral Tsunoda, Admiral in Command of the Takeshiki Secondary Station, made a report on February 16 to the Minister of the Navy, Admiral Yamamoto, who, by telegram dated 21st, same month, gave his sanction to the necessary steps being taken. Henceforward, the admission of patients was made the same as in a Naval Hospital. The institution continued to exist under these conditions down to the conclusion of the war.

II. Ward Barracks.

Ward Barrack at Takeshiki.—This was built in February, 1904. It is a single-storied wooden building, covering an area of 93 *tsubo*, and comprises a medical officer's room, a bed-room for the same, one room for consultation, a dispensary, a sick berth steward's office, one for the sick berth attendant's night-watch, four rooms for patients, three rooms for medical stores and patients' hospital wardrobe, one for a kitchen, one for a bath and one for a water-closet.

When the establishment was re-organized on the hospital plan, the whole of wards were converted into a single surgical ward, with accommodation for about 12 patients (the maximum capacity being 20). Ward No. 3 was made into an operating-room, and a detached building was erected to serve as a mortuary, at a distance of some yards from the water-closets. This, however, was never used for its proper purpose, but was employed as a pathological and chemical laboratory. The necessity of having electric lights having been brought forward on February, 4, 1904, their instalment was begun on April 29, and the lights were used on and after the 7th of May.

Fukaura Ward-barrack.—Built in August, 1888, a single-storied wooden building of 63.35 *tsubo*, comprising a medical officer's room, one for consultation, a dispensary and sick berth stewards' office, a room for the sick berth stewards and attendant on night-watch, two wards, a larger and a smaller, a room for hospital wardrobe stores, one for a bath, two water-closets and a kitchen. The barrack was chiefly used for medical cases, and the ordinary number admitted was about 16 (the maximum number admissible being 37). There is besides a prison attached to the Submarine Mining Corps, which was used as a mortuary.

Infection Ward-Barrack.—Built in March, 1902, a single-storied wooden building of 37.5 *tsubo*. The floors are all in concrete facing, except in the room for the nursing staff and their night-watch. It comprises one room for sick berth stewards and attendants and for their night-watch, two wards, one bathroom, and one water-closet; and stands at a distance of more than 10 *cho** west of the Takeshiki Ward-Barrack, being surrounded on east, west, and north, by low hills, and open to-

*1 *cho*=360 feet.

wards the south, with a prospect into a dale facing the sea. It can accommodate 10 patients (at maximum 13).

The above three ward-barracks together with the Fukaura Temporary Ward-Barrack are capable of containing 70 patients in all.

Fukaura Temporary Ward-Barrack.—This is a single-storied wooden building of 98 *tsubo* originally used for night quarters by warrant officers of the Submarine Mining Corps, as also for a barrack for petty officers and men. It comprises a consultation room, four sick-rooms, and two water-closets; and was opened on March 4, 1904, as a temporary ward-barrack, chiefly for patients suffering from venereal and other internal diseases and also for miscellaneous patients, and has accommodation of 32 beds. The period of time during which this establishment was kept open extended over nineteen months.

Takeshiki Temporary Ward-Barrack.—This is a two-storied wooden house built in February, 1902, and originally designed as a barrack-room for the crews of the torpedo boat flotillas. It stands in front of the office of the Naval Port. It is a building not only well adapted for conversion into wards, but also conveniently located, so that the appropriation of its upper story as an emergency ward had long been counted upon. It is capable of accommodating 80 patients. On May 29, 1905, when a large number of the wounded in the battle of the Japan Sea was received, this building was immediately opened and it was not closed until after the conclusion of peace, the number of days during which it was kept open being 144.

III. Disinfection-Building, Operation Room, Pathological and Chemical Laboratory and Refrigerating Room.

Disinfection-Building.—This building was finished on April 27, 1904, and on May 12, the Autoclave and its belongings arrived from the Engineering Branch of the Sasebo Naval Yard, the installment being completed on June 24. The boiler for the autoclave was one already on hand at the Takeshiki Secondary Naval Station. The autoclave itself was made at and furnished by the Sasebo Naval Arsenal. The cost of repairs, transportation and instalment amounted to *yen* 350.

The disinfecting building is situated somewhat nearer to the sea than the infection ward-barrack, and stands on a plateau made by cutting away the foot of a hill to the north-west. The building area is 16 *tsubo*, the cost of construction came to *yen* 960. It comprises an infected, and a non-infected compartment, and a boiler-room.

Operating-Room and Pathological Laboratory :—The plan of this new establishment was broached in October 1903, its necessity was recognized on January 16, 1905, when the building was commenced. It was finished on March, 4.

The operation room covers an area of 12 *tsubo* and the laboratory 5; and the building expenses are *yen* 325 for the latter and *yen* 812.50 for the operation-room. With the sanction obtained on the 22nd, same month, five incandescent lights were installed in the middle of the operation-room.

Ice-Making Machine.—Having obtained permission to buy the above machine in November, 1904, as part of our medical stock, we received the notice of the chase contract effected from the apothecary in charge of Medical Dépôt of Sasebo Naval Hospital. The machine arrived here in September, 1905, and was fixed up in October, at the back part of the boiler in the Repair Work-Shop of the Station.

IV. Medical Stores.

Out of our medical stock in store, the only supplies we were called upon to make were the furnishing of small medicine chests to nine torpedo boats belonging to the Takeshiki Secondary Naval Station. The regular annual supply of medical stock for use at sick-rooms was obtained from the Sasebo Medical Dépôt, any deficiency that occurred being made good from time to time on demand.

V. The Organization.

The medical staff consisted of the following :—

Director.....Fleet Surgeon	1
Fleet Surgeon T. Nakao, replaced afterward by Surgeon Inspector U. Ishiguro.	
Surgeon.....	1
Assistant surgeons	2

Medical Assistants.—At the time when a great many wounded patients entered the hospital after the battle of Japan Sea on May 28, 1905, a surgeon of the Kure Naval Hospital came here by official order on June 1, and attended to the treatment of patients till the 21st; and a surgeon sub-lieutenant from the Taishu Guard Hospital and a medical orderly with ten nurses under him arrived on May 28 and gave valuable assistance until the end of the month.

Volunteer Nurses.—Since the outbreak of hostilities several bodies of volunteer nurses had been formed by the ladies of officers and officials of the Navy, resident at Takeshiki, as well as by the wives and daughters of warrant officers, petty officers and seamen. In this work there were also associated the wives of policemen, postmasters, licensed medical practitioners, as well as of town people at large. These persons were all very eager to do what they could in nursing and otherwise giving comfort to the sick and wounded at the hospital; and thus rendered a great deal of assistance, especially after the battle of the Japan Sea, when so great a number of the wounded lay in the hospital. They all worked with genuine enthusiasm and gave much satisfaction to the patients.

VI. In-Patients.

The total patients admitted during the war numbered 924, their number of days' treatments, extending over the whole period, was 25,026, giving an average of 40.43 per day. The number of those who recovered and left the hospital was 696, those transferred to another hospital numbered 189 in all. There were 17 cases of death. Only one man wounded in action entered this hospital during the year 1904; but in 1905 the wounded in the battle of the Japan Sea that came into this hospital totalled 62.

**TABLE SHOWING THE NUMBER OF PATIENTS AMONG ENLISTED
MEN OF THE NAVY.**

(Feb. 6, 1904—Oct. 16, 1905).

Disease or Injury	Total Admis- sion	Reco- very	Removal to other Hospitals	In- valided	Died	Patients Remain- ing
General Diseases	104	94	6	—	4	—
Diseases of the Nervous System ...	32	21	9	—	1	1
Diseases of the Respiratory System.	126	52	68	—	2	4
Diseases of the Circulatory System.	21	15	5	—	—	1
Diseases of the Digestive System...	136	117	10	—	7	2
Diseases of the Genito-Urinary Systems.....	17	14	3	—	—	—
Veneral Diseases.....	251	221	25	—	—	5
Diseases and Injuries of the Eye...	20	10	9	—	—	1
Diseases and Injuries of the Ear...	6	4	1	—	—	1
Diseases of the Skin and Connective Tissue.....	31	23	8	—	—	—
Diseases of the Organs of Locomotion	17	10	7	—	—	—
Injuries.....	78	61	11	—	—	6
Injuries in Actual Engagement ...	62	33	27	—	2	—
Total.....	901	675	189	—	16	21

N.B.—The total number of days' sickness is 24,395, and average days' sickness per case 36.1. The figures above comprise 54 officers and warrant officers, but not the 35 patients admitted and treated during the period 6—20 February before the ward-barracks had yet been recognized as a Naval Hospital.

**TABLE SHOWING THE NUMBER OF PATIENTS OTHER THAN THE
ENLISTED MEN OF THE NAVY.**

(Feb. 6, 1904—Oct. 16, 1905).

Diseases and Injury	Total Admis- sion	Reco- very	Removal to other Hospitals	Died	Patients- Remain- ing
General Diseases	7	6	—	1	—
Diseases of the Respiratory System.....	1	1	—	—	—

Diseases of the Digestive System	7	7	—	—	—
Diseases and injuries of the Eye	1	1	—	—	—
Injuries.....	7	6	—	—	1
Total.....	23	21	—	1	1

N.B.—The total number of days' sickness is 631, the average days' sickness per case, 27.43.

VII. Number of Surgical Operation.

The principal surgical operations performed during the war numbered 171. The statistics of their progress and the results of treatment are as shown below :—

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Recovery	Improved	Died	Treatment Discontinued	
Enucleation of Cervical Glands.....	3	1	—	1	2	—	—	1	—	2	Tubercular peritonitis Acute peritonitis Appendicitis Perityphlitis
Enucleation of Axillar Glands.....	1	—	1	—	—	—	—	1	—	1	
Enucleation of Inguinal Glands.....	1	—	—	—	—	1	1	—	—	—	
Incision of the Hydrocele of Spermatic Cord.....	1	—	—	1	—	—	1	—	—	—	
Extraction of Tooth.....	1	—	1	—	—	—	—	—	—	1	
Laparotomy	4	3	—	—	—	1	2	—	2	—	
Incision of Fistula in Ano.	14	—	3	4	4	3	12	—	—	2	
Excision of Piles	8	—	3	3	2	—	8	—	—	—	
Radical Operation for Inguinal Hernia.....	1	1	—	—	—	—	1	—	—	—	
Enucleation of the Inguinal Bubo, (venereal)	51	21	6	14	7	3	43	1	—	7	

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Recovery	Improved	Died	Treatment Discontinued	
Incision of the Inguinal Bubo. (venereal).....	55	1	4	7	21	22	45	1	—	9	
Iridectomy	1	—	1	—	—	—	1	—	—	—	
Incision of the Abscess on the Chest	1	—	—	1	—	—	1	—	—	—	
Incision of the Abscess of Ribs.....	2	—	2	—	—	—	—	—	—	2	
Amputation	8	2	1	1	3	1	4	1	—	3	Fingers .....6 Legs .....2
Amputation at the Knee-Joint	1	—	—	—	1	—	1	—	—	—	Mutilation of the right leg
Suture of the Incised Wound	1	—	1	—	—	—	1	—	—	—	Large incised wound of the fore arm
Extraction of Shell Fragments from Gunshot Wounds	8	3	—	3	—	2	4	—	—	4	Wounds of the face, scapula, upper arm, lumbar region, legs, foot, (one each) buttocks (2)
Extraction of Foreign Bodies from Gunshot Wounds	1	—	—	—	1	—	—	—	—	1	Perforated wound of the thigh
Extraction of Bone-Fragments from Gunshot Wounds	2	2	—	—	—	—	2	—	—	—	Perforated wound of the chest & abdomen
Reduction of Fractured Bone.....	5	3	1	—	1	—	1	—	—	4	
External Urethrotomy ...	1	—	—	—	—	1	1	—	—	—	Contusion of the Urethra
Total.....	171	37	24	34	42	34	129	3	2	37	

SECTION VII. PORT ARTHUR NAVAL HOSPITAL.

I. Its Construction.

On the 2nd of January, 1905, seven days after the capitulation of Port Arthur, official appointments for the Naval Hospital at Port Arthur were made. Surgeon-General K. Sudzuki who was appointed Director of the Hospital, with others under him, arrived at Port Arthur on February 4, and on the 22nd, same month, the hospital was temporarily opened in the barracks formerly occupied by the Russian Marine's Division. Sick and wounded patients were admitted into this hospital until the 25th of July when it was removed to the site of the former Naval Hospital in the New Town.

The present hospital is situated by the seaside at the southern extremity of the New Town of Port Arthur, at a distance of about one *ri* from the Old Town. Towards the east it looks over the harbour and commands a fine view. There are no dwelling houses in the neighbourhood, and there is an open space behind, with here and there several pieces of cleared land, evidently designed for the extension of the hospital buildings. The whole is constructed on a vast scale.

The buildings now appropriated to our hospital were eight, viz.: one administrative building, five pavilion wards (of which one was the director's official residence), a barrack and a kitchen. There is further a pump-shed, a building for the disinfection plant, and a laundry, the last of which was re-built after the removal.

Administrative Building.—A brick-built, two-storied house roofed with galvanized iron plates and floored, both in the upper and the lower story, with concrete facing, the girder frame of the upper floor being of “ π ” shaped beams, and the windows having planed shutters. Each room has the smallest possible number of doors, and, not only the interior of each room, but also the passages, are provided with heating apparatus, great care apparently having been taken to secure protection against the cold winds. The staircases are of iron frame set in stone; and with the exception of the doors of the chambers, no wood is to be found in the material employed—so great was the care taken to guard against the occurrence of fire.

Ward Pavilions.—There are four ward pavilions, all single-storied brick buildings. Pavilions No. 1 and 2 are for surgical cases, the one admitting 26 patients, the other 43, with an operating room attached to each; Nos. 3 and 4 are for medical cases, and can accommodate 42 patients each; Nos. 3 and 4 are for medical cases, and can accommodate 42 patients each. The construction and equipments are much the same as those of administrative building above described. On either side of the wards are provided exercise places for the patients. The lavatories, chamber-pots, etc., affixed are all of porcelain, the water being conducted through iron pipes, and the sink-hole acting automatically. Upon the whole there is nothing left to be desired.

Pavilion No. 5. (Director's Residence).—A double-storied brick building with a spacious exercise-place for patients. The pavilion in question having been originally designed for the hospital director's official residence, is more finely and better equipped in the interior, as compared with the rest, and is capable of receiving 47 patients.

Kitchen.—This is a single-storied brick building, divided into compartments, e.g., a cooking room, an office, bed-rooms, a bakery, a storeroom, etc.; in the basement room there are two boilers for the exclusive use of the building; and it is evident that if the kitchen utensils were properly provided, victualing for over 1,000 men could be prepared here without much difficulty.

Barrack.—Built of wood, white washed. It is incomplete in its equipment—the outer walls are somewhat thin, and the windows with single shutters are but imperfectly provided against the cold in severe weather.

Laundry.—This was originally a log-built storehouse after the old Russian style; but after our removal here we effected a partial re-construction so as to make it serve in addition for an officer's bathroom, as also for drying-room, ironing-room, Japanese matting room, etc. Furthermore, temporary measures were taken to meet the requirements of the time, as constructing branch-pipes to draw water from the kitchen-pipes, building a brick kitchen-range and gutters for the drains around the room, covering the ground-floor with concrete facing, etc.

Disinfection Building.—This stands next door to the laundry and right at the back of the hospital. It is a rough wooden building having doors in two

places, but allowing for no distinction between infected and non-infected apartments. The inner chamber is too small and inconvenient to work in; so much so that it was considered necessary to have it either removed to a better place or partially improved, if not built afresh.

Pump Shed.—Both roof and side walls are of galvanized iron plates. It is really a *hottate goya* (a shed built on poles driven into the ground).

Patients' Baths.—Each of the wards has a bathroom attached. In this room there is an oblong-shaped bathing tub made of copper, and two cylindrical vessels containing hot and cold water respectively. These are conducted into the tubs by iron pipes. The bathers can adjust the temperature of the water to suit their tasks or change the water by pulling up the plug. Outside the chamber, there stands a copper boiler fixed to a furnace provided for use whenever a larger quantity of water is wanted, or when baths have to be taken in a hurry.

Steam-Bath after the Russian Fashion.—The main parts of the steam-bath house after Russian fashion are the bathing place and boiler-room. There are two places—one for the use of officers and the other for the petty officers and seamen. These two are constructed in the same style.

The bath-house for the petty officers and seamen is an air-tight brick building, measuring 21 *shaku* in width, 30 *shaku* in length, and 13 *shaku* in height, together making 8,190 cubic *shaku* in capacity. When a bath is to be taken, an iron pillar is heated red hot by the fire from the furnace at the bottom. Then by opening a stop-cock, hot water from the boiler is squirted out in fine spray over the heated pillar. In this way steam is produced in five minutes and fills the whole space.

The officer's bath-house is constructed exactly in the same way as that for the petty officers and seamen, differing only in size, i.e. 9.4 *shaku* wide, 17.3 *shaku* 13 *shaku* high, making 2,114 cubic *shaku* in capacity.

II. Supply of Medical Store.

Prior to the enforcement of the Regulations relating to the Port Arthur Navy Hospital, dated January 1905, the Navy Medical Department at the Imperial Headquarters set about an investigation with regard to the standing stock

of medical stores required for the opening of the Hospital at Port Arthur, and made preparation for the supply out of the stores at Sasebo, by change of custody.

Chief Apothecary (2nd class) T. Wake of the Port Arthur Naval Hospital sent in a demand to the Sasebo Medical Dépôt for the standing medical stock necessary. This was based on the investigation made at the Naval Medical Dépôt of the Imperial Headquarters, and included a supply of tools and implements requisite for a general cleaning after the war, as also for disinfection against epidemic diseases; and such other requisites as were not prescribed in the Regulations. As for further supplies, they were to be granted from time to time, according to the needs of the hospital after its opening, and when the amount of captured stores should have been ascertained.

Consumptive medical articles and drugs were provided at first in such quantities as were considered sufficient for half a year at the average of 100 patients per day—the number estimated of in-patients on the standard of supply for the Kure Naval Hospital.—One-fourth of the annual supply for Kure, i.e., a supply for three months was provided to begin with. Afterwards, however, on account of the repeated reports of the approach of the Russian Second Pacific Squadron, and for fear of the communications with home being cut off, a second supply was made on the same basis as before, i.e. the Kure amounts for 3 months. The supplies thus twice made together reached the estimated amount of one year's supply for the Port Arthur Naval Hospital.

At the time of the capitulation, the wounded and sick of the enemy were very numerous, and the barracks of the Kwang-tung Marine's Division and the Submarine Mining Corps, as well as the Naval Hospitals were crowded to excess. The members of our Army and Navy Medical Corps now took on themselves the treatment of these sufferers, the medical stores being kept at the Medical Dépôt of the Fortress. After due conference these were delivered up to us and those applicable to immediate use were kept on hand. In addition to the above, the medical stock forwarded to us by the Hospital Ship *Saikio Maru* as part of the contributions from an English ship, the *Hannibal*, together with the contributions from the Red Cross Society and the Volunteer Nurses' Associations having been received, our stores were now ample enough to enable us

to make distributions of supplementary supplies to the Port Office, the Submarine Mining Corps, Engineering Works, Dairen Defence Corps, Dairen Engineering Department and various Divisions under the control of the Port Arthur Naval Station, as also to the ships, *Kongo*, *Suo*, *Tsugaru*, *Anegawa Maru* and other ships of the Sea-Sweeping Division.

In eight months, from the opening of the hospital until the restoration of peace, we made distribution of 940 sorts of stores to hospitals and 389 sorts to other places. The further supplies we made on special accounts—such as to a party commissioned with bringing out captured ships who had some stores from home on board, but had run short on certain lines, or to ships which, under urgent telegraphic orders, had no time to make due provision for medical stores, before their departure—reached a considerable total.

III. Disposition of Captured Goods.

On March 28, 1905, Fleet Surgeon M. Takekida and Chief Apothecary (2nd class) T. Wake were appointed members of a commission for the disposition of captured goods.

The wounded and sick Russians in their own hospital having all been discharged, and the hospital itself having come under the control of our Navy, an arrangement was made for opening a new hospital, while at the same time an adjustment was commenced of the captured stores lying both in and out of the hospital. Those already made use of in the temporary hospital, together with those now received, were classified according to the uses for which they were designed, and arranged in three groups; viz., 1. Office furniture, 2. Lodging furniture, 3. Common furniture for patients, (or sick-room furniture). Having gone through formal delivery according to prescribed rules, they were taken into our safe keeping.

Their details are given below :—

1. OFFICE FURNITURE.

	pieces		pieces
Bedsteads	100	Chairs (middling).....	3
Benches	2	Chairs (common)	98
Chairs (high class)	2	Desks	25
Closets	17	Hat-racks.....	12
Side-boards	3	Clocks	4
Stands	4	Safe	1
Lamps	14	Ice-box	2
Basins	6	Toilet-cases	40
Buckets	5	Stoves	2
Shelves	3	Anvil	2
Tables	10	Screw	1
Screw (large)	1	Fire-shovels (b)	15
Bellows.....	1	Grindstone	1
Tongs.....(pairs)	2	Pickaxes	5
Mallets.....	3	Portable Pumps	2
Fire-shovels (a).....	5	Thick Canvas Pipes.....	7

2. LODGING FURNITURE.

Bedsteads	16	Chairs (high class)	31
Benches	14	Chairs (middling).....	19
Chairs (low class)	44	Screens	10
Desks	15	Chests of drawers.....	13
Cupboards	12	Tables	7
Clothes shelves	14	Basins	13
Kitchen-dressers	7	Pitchers	13
Stands	11	Shelves.....	2
Lamps	17	Buckets	13
Looking Glasses	8	Hat-racks	17

Toilet-cases	4	Aleove ornaments.....	4
Candlesticks	12	Flower-vases.....	4
Clocks	4	Ice-box	1
Tablets.....	7	Kitchen range	1

3. SICK-ROOM FURNITURE.

Name	No.	Valued at	Name	No.	Valued at
Tables (middling)	25	212.500 ^{yen}	Boxes for patient's use.....	17	42.500 ^{yen}
Tables (low class)	8	24.000	Ice-boxes	3	13.500
Tables (round).....	5	32.500	Boxes for sundry	9	22.500
Chairs (middling)	14	105.000	Chemical stands	8	144.000
Chairs (high class).....	5	60.000	Shelves (a)	14	210.000
Chairs (Long)	3	45.000	Shelves (b)	18	90.000
Chairs (common)	120	240.000	Drug closets.....	4	80.000
Benches	10	75.000	Washing basins	15	4.500
Clocks	6	30.000	Pitchers	15	4.500
Iron bedsteads.....	238	4,284.000	Buckets	20	7.000
Stands for Patients' things	141	225.600	Looking-glasses	4	30.000
Stands	60	39.000	Oil-lamps	15	30.000
Washing stands	4	8.000	Candlesticks.....	7	1.750
Tables (for serving food).....	4	4.800	Bread-plates.....	15	3.750
Cooking stand.....	1	2.000	Soup-plates	90	16.200
Plates	120	21.600	Hat-racks.....	13	23.400
Mugs.....	120	9.600	Bath-tubs	6	210.000
Knives	120	42.000	Water-tubs	6	21.000
Forks	120	36.000	Table-cloths.....	12	18.000
Spoons	120	42.000	Pillows.....	120	24.000
Frying pans	8	4.000	Pillow-covers	120	18.000
Ladles	7	2.100	Mattresses	120	216.000
Enamelled pans	5	1.000	Mattress covers	120	120.000

Name	No.	Valued at	Name	No.	Valued at
Iron-handled dippers	6	1,800 ^{yen}	Sheets	150	150,000 ^{yen}
Mincing machine	2	7,000	Steam sterilizer	1	1,000,000
Hot water apparatus.....	7	1,750,000	Boilers	6	18,000,000
Steam boilers	4	360,000	Kitchen boilers	6	6,000,000
Kettles	5	42,500	Water pump	1	800,000
Samovars	7	28,000			
Copper pans	10	45,000	Total value.....		35,080,600

N.B. In addition to the above list, two sets of steam washers with belongings and two steam disinfectors were found left still unpacked within the hospital compound. These being useless to us were sent for safe-keeping at the Direction of Supplies and Accounts.

IV. Organization.

The staff consisted of the following :—

Director.....	Surgeon Inspector.....	1.
	Surgeon-General K. Suzuki.	
Fleet or Staff Surgeons.....		2.
Surgeons.....		3.
Supernumeraries.....	Probationary Assistant Surgeon.....	1.
Apothecaries		2.

V. Admission of Patients.

The wounded and sick received into the Port Arthur Naval Hospital were men of the Navy, and those on naval service, as well as workmen and coolies belonging to the several shore stations, squadrons, and parties for bringing out the refloated ships, etc., under the control of the Port Arthur Naval Station.

As to the admission of patients from outside the jurisdiction of our Navy we refer to the following official letter from Vice Admiral Shibayama, Commander-in-Chief of the Naval Station :—

“ It is deemed permissible, as a necessary measure, that such people as agents dispatched from the central treasury, canteen stewards, contractors and others on tours of inspection, either residing or staying by permission within the

Naval District of Port Arthur, should, if attacked by sickness, be taken into the hospital and put under treatment for the time being, as there exists at present no means provided for their medical treatment in the town: Also that such patients should be made to pay for their cost in accordance with the Provision in Art. 93 of the Navy Pay Warrant, etc.”

To this the Minister of the Navy granted sanction as below :—

“ That the patients described in the official dispatch should be treated for the time being according to Art. III, Notification No. 53, dated March, 1904.”

“ Art. III Notification No. 53.—That the students of Mereantile Marine School studying in the Navy, as also cadets, warrant officers, and civilians who get wounded or fall sick from causes other than public duty should be permitted to enter the Naval Hospital with the sanction of the Commander-in-Chief of the Naval Station.”

The total number of patients received during the campaign was 513 and the number of days' treatment extending over the whole period is 19,089, with an average of 80.54 per day. The number that recovered and left the hospital, was 373, transferred to other hospitals 12, invalided 2, dead 12, leaving a remainder of 114.

The following shows the patients in the hospital with their diseases classified :—

PATIENTS AMONG ENLISTED MEN OF THE NAVY.

(From Feb. 22, 1905 to Oct. 16, 1905.)

Disease and Injury	Total Admission	Recovery	Removal to other Hospitals	Invalided	Died	Patients Remaining
General Diseases	23	17	1	—	1	4
Diseases of the Nervous System ...	14	8	2	—	1	3
Diseases of the Respiratory System.	33	15	—	1	1	16
Diseases of the Circulatory System.	8	6	—	—	—	2
Diseases of the Digestive System ...	77	66	1	—	—	10
Diseases of the Genito-Urinary System	14	10	—	—	—	4
Venereal Diseases	76	66	—	—	—	10

Disease and Injury	Total Ad- mission	Reco- very	Removal to other Hospitals	Invalid- ed	Died	Patients Remain- ing
Diseases and Injuries of the Eye...	6	6	—	—	—	—
Diseases and Injuries of the Ear ...	2	1	—	—	—	1
Diseases of the Skin and Connective Tissue	4	2	—	—	—	2
Diseases of the Organs of Locomotion	8	6	—	—	—	2
Injuries.....	27	13	6	1	—	7
Sundries	1	—	—	—	—	1
Total	293	216	10	2	3	62

N.B.—The total days' sickness is 12, 676, the average per case 43.26. The figures comprise 11 officers and warrant officers.

PATIENTS OTHER THAN EXLISTED MEN OF THE NAVY.

(Workmen, coolies and servants, etc.)

(Feb. 22, 1905—Oct. 16, 1905.)

Disease and Injury	Total Ad- mission	Recovery	Transfer- red to other hospitals	Died	Patients Remain- ing
General Diseases	37	22	—	6	9
Diseases of the Nervous System.....	2	—	—	—	2
Diseases of the Respiratory System...	12	7	1	1	3
Diseases of the Circulatory System...	4	3	1	—	—
Diseases of the Digestive System.....	38	30	—	1	7
Diseases of the Genito-Urinary System	3	2	—	—	1
Venereal Diseases	41	29	—	—	12
Diseases and Injuries of the Eye.....	3	3	—	—	—
Diseases of the Skin and Connective Tissue	7	6	—	—	1
Diseases of the Organs of Locomotion	6	3	—	—	3
Injuries	27	22	—	—	5
Total.....	180	127	2	8	43

N.B.—The total days' sickness is 5,392, the average per case 29.96.

TABLE SHOWING THE NUMBER OF IN-PATIENTS WHO HAD NO
CONNECTION WITH THE NAVY.

Disease or Injury	Total Ad- mission.	Recovery	Trans- ferred to other Hospitals	Died	Patients Remain- ing
General Diseases	27	18	—	1	8
Disease of the Respiratory System...	1	1	—	—	—
Diseases of the Digestive System ...	5	4	—	—	1
Venereal Diseases.....	4	4	—	—	—
Diseases and Injuries of the Eye...	1	1	—	—	—
Injuries	2	2	—	—	—
Total.....	40	30	—	1	9

The total days' sickness is 1,021, the average per case 25.53.

VI. Out-Patients.

The patients from the shore establishments of the Naval Station, the Direction of Accounts and Supplies at the Station, the associated bodies of contractors for the refloatation of sunken vessels, and others in business connected with the Naval Station were treated at the Port Arthur Naval Hospital under the name of out-patients,—civilian patients connected with the Naval Station and the Direction of Accounts and Supplies, under the name of *bunai*, i.e., “out-patients from within the circles of the Navy” and all those who are absolutely disconnected with the Navy under the name of *bugai*, i.e., “out-patients from without the Naval circle.” After the removal in July, 1905, a branch ward of the Naval Hospital was established within a building, formerly a Russian Court, in the Old Town, for the special accommodation of the above patients, who were placed under the charge of one sick berth steward and two attendants.

The number of out-patients from the opening of the hospital till the restoration of peace was as shown below :—

Out-Patients	889
Men, in Naval circles	139
Men, civilian (<i>bunai</i>).....	431
Out-Patients (<i>bugai</i>).....	319

N.B. Of the out-patients of the second class (*bugai*) 52 were suffering from *kakke* while only one case occurred among those of the *bunai* class i.e. a coolie engaged in the Direction of Supplies and Accounts.

VII. Number of Surgical Operations.

The principal surgical operations numbered 104 cases, which were performed in the period of time from March 6 when patients were first admitted after the opening of the hospital on February 22, until October 16, 1905.

Their results, number of days' sickness and the discharges of the patients are as shown below :—

Name and Character of Operation	No. of Cases	Duration of Treatment after Operation					Result				Remarks
		Less than 10 days	11-20 days	21-30 days	31-60 days	Over 61 days	Cured	Improved	Died	Treatment Discontinued	
Removal of Nasal Polypi	1	—	—	—	1	—	1	—	—	—	
Enucleation of Lymphatic Glands	3	—	—	1	1	1	2	—	1	—	Inflammation of the right inguinal glands 1. Inflammation of the right and left axillar glands, one each 2.
Radical Treatment of Hernia.....	1	—	—	1	—	—	1	—	—	—	The inguinal hernia on the right side.
Incision of the Fistula in Ano.....	10	—	—	—	4	6	6	4	—	—	
Excision of Piles.....	17	—	1	3	10	3	16	1	—	—	

Operation for Urinary Fistula.....	1	—	—	—	1	—	—	1	—	—	
Operation for Phimosis.....	4	—	3	—	1	—	4				
Enucleation of the In- guinal Bubo (venereal).....	27	—	2	10	10	5	25	2	—	—	8 on the right side, 8 on the left side, 11 on both sides.
Incision of the Inguin- al Bubo (venereal) ..	7	1	—	—	6	—	3	4	—	—	4 on the right side, 2 on the left side, 1 on both sides.
Canterization of Soft Chancere	7	—	—	2	5	—	7	—	—	—	
Enucleation of the Eye.....	1	—	—	1	—	—	1	—	—	—	Contused wound of the right eye.
Removal of Tumor	2	1	—	1	—	—	2	—	—	—	Papilloma.
Incision of Abscess	12	—	2	2	7	1	10	2	—	—	Periproctal abscess 1 perineal abscess .....2 Bursitis .....1 Myositis .....1 Suppuration of lym- phatic glands .....3 Abscess on the mons pubis .....2 Phlegmon .....2 Contused wound of the skull.
Operation for Contused Wound	2	—	—	1	1	—	2	—	—	—	Compound fracture of the skull.
Trepanation	1	—	—	—	1	—	1	—	—	—	1 for the inferior maxillary bone, 1 for the ulinary and radial bones of the left arm, 1 for the left knee- pan.
Osteo-suture or Osteo- rhaply	3	—	—	—	1	2	2	—	—	1	1 for the contused wound of the left hand, 3 for the compound fractures of the fingers of both hands.
Amputation of the Fingers	4	—	1	—	1	2	1	1	—	2	Contused wound of the fingers of both hands.
Interphalangeal Amputa- tion of Fingers	1	—	1	—	—	—	—	1	—	—	
Total	104	2	10	22	50	20	84	16	1	3	

VIII. Laboratory Work.

The tests and examinations done during the period from the opening of the temporary hospital in February, 1905 to the restoration of peace, numbered 377, inclusive of 315 on drugs, 48 on water, 2 on rums, 9 on bread, 1 on flour, 1 on spirit, 1 on a consumable article. The most important was the testing done on drinking water.

At the time when our Naval Station was first opened here, the water-works were in ruin and useless, so that distilled water was largely used; but after the repair of the water-works had been effected, the city water came into general use.

The water-distillery is situated at the foot of the Golden Hill—a Russian construction on a vast scale. At the time, when we took the place over, three boilers were standing, one damaged, the other two in working order, by which nine tons of distilled water was obtainable every day. Three tons of this were applied to feeding steam boilers, while the remaining six were used for drinking purposes.

It must be noted, however, that something had evidently gone wrong somewhere between the mouth of the distillator and the reservoir of water, and that there was a suspicion that the sea-water was leaking in. But as there existed no other means of procuring good drinking water, this water was generally drunk, until the supply from the water-works came to be restored.

Water-Works.—There were two—the old and the new, the one of Russian construction, the other of Chinese—each with its source of supply in the high-lands of Pali-chwan.

The course of water running around the foot of Sun-shu Shan along the railway line, past the front of the armoury and over the hill of Pai-yüeh-Shan into Reservoir No. 1, belongs to the old water-works. The one running at the foot of the Sun-shu Shan towards the south-west, crossing right through Chang-kia-tun into Reservoir No. 2, and then past the pumping place into the reservoir at Hsiao-ngan-tze Shan belongs to the new water-works.

The quantity of water obtainable from both water-works is sufficient to supply as much as 1,300 tons day and night.

The source of water lying on the hills between Erh-lung Shan and Kuropat-

kin Fort covers an area of about 500 *chōbu* (1,225 acres). The surface of the land extending as far as the Lang-yin-chūan (source of water in Chinese days and now in ruin) has a gentle slope towards the south-west, from a line rising from the redoubt, and terminating at Kuropatkin Fort. It is uneven and irregular, and no trees worth looking at are to be found about here.

The water-course is constructed on the "culvert" system, with covered passage running across each other in different directions, some four or five *shaku* under the ground. The old and new water-courses have each a distinct source and never come together. The dark under-ground passage being 6 *shaku* high and 2.5 in width is walled with irregular-shaped stones—some large and some small, and consolidated with cement, the bottom being laid with pebbles of the size of a walnut. In the interior of this culvert, there are openings or slits left at the height of 0.1 *shaku* or 0.2 from the bottom, so as to allow water to percolate in freely. A number of these culverts converging at last form one channel and terminate in a round well about 25 *shaku* in depth and 6 *shaku* in diameter.

Suppose you go down into this well and look into its interior, the depth of water will be found to be only some 0.8 *shaku*; and the culverts, dark though they are, will make you feel that there is fresh water dripping in, which will be delightfully pure and refreshing to the taste. Iron pipes are inserted to draw water where needed.

Pumping Station.—This is situated in the Army Water Supply Department. At the time of the capitulation it was not in working condition; but by June 11 all repairs and reconstruction were completed. Just above the station, on the hill known as Hsiaongan-tze-Shan stands the reservoir at a height marked 250 *shaku*. The water is pumped up from the pumping station and pours into the reservoir on the top, so that it can be distributed therefrom to every part of Port Arthur. This reservoir is made of brick and is about 15 *shaku* in depth.

The water-storage well in the former Russian Hospital in the New Town stands by the side of the pumping-station near the sea. The quantity of water to be obtained by working the engine to the highest pressure of 60 lb. is 80 tons per day; and, at the pressure of 25 lb., about 30 tons for storage. This

well standing, though it does, near the sea, is nevertheless perfectly free from salt.

At first we supposed the source of water to be at some distance off. So we tested the quality of the water taken at a place we thought most likely to be its source, and then made the following experiment. Into the supposed source we threw a large quantity of thick salt-water and let it stand for a day or so ; then we measured the quantity of chloride contained in the storage well, to see if there were any communication between the water in the two different places. But the result always proved negative ; we have not yet discovered the real source of the water supply.

BOOK II. Sanitary Conditions During the War.

CHAPTER I.

PREPARATIONS FOR ACTION AND

SANITARY CONDITIONS OF THE FLEET BEFORE THE WAR.

SECTION I. PREPARATIONS FOR WAR.

The peaceful relation between Russia and Japan being about to be broken, our standing squadrons were dissolved and organized afresh into three squadrons, of which the First and Second being united formed a Combined Squadron. The Commander-in-Chief of the First Squadron was Vice-Admiral Togo, with Rear-Admirals S. Dewa and T. Nashiba; under him the Second Squadron was commanded by Vice-Admiral H. Kamimura with Rear-Admirals S. Uriu and S. Mitsu; while Togo commanded the Combined Squadron.

The Third Squadron was commanded by Vice-Admiral H. Kataoka with the Rear-Admirals M. Togo and S. Hosoya as commanders under him.

The main force of the Combined Squadron was collected at Sasebo, while that of the Third Squadron at Kure; and all were busily engaged, working day and night in preparation for active service—taking in coal, water, clothing, provisions, naval stores, medical stores, etc., painting the hulls of ships a dark grey colour, etc.

Of the medical stores shipped on all vessels of the line as well as on those employed for special service, details have been given in Book I., Chap. III, Sect. II, 3.

The following is the list of patients' clothing, bedding, etc., shipped on various vessels of the fleet and fleet auxiliaries and for the several naval corps starting for the front:—

Articles.	Ships and Naval Corps.	Converted War Ships.	Repair Ships.	Transport ships (Those for sole use in Naval Station excepted.)	Despatch Vessels.	Submarine Mining Corps attached to the Fleet.	Temporary Submarine Mining Corps.	Defence Corps of Temporary Naval Base.
Wadded, long white garments...		40	40	60	40	16	10	120
Unlined, long white garments...		40	40	60	40	16	10	120
Patients' belts		20	20	30	20	8	5	60
Cotton mattresses.....		—	—	—	—	—	—	—
Mattress covers		40	40	60	40	16	10	120
Pillow covers		20	20	30	20	8	5	60
Blankets.....		60	60	90	60	24	15	180
Mosquito curtains		—	—	—	—	8	5	60

SECTION II. SANITARY CONDITION OF THE FLEET BEFORE THE WAR.

The average strength of the total force of the Navy for the year 1903 being 31,583, the daily ratio of the sick per 1,000 of average strength was 61.03. Compared with the same item for the year 1901, the above shows an increase of 0.49, and for the year 1902, of 5.14, as shown in tabulated form below :—

NUMBER OF SICK IN THE WHOLE NAVY FROM 1901 TO 1903.

(All above warrant officers excluded.)

Year.	Average Force per Day.	Patients Remaining from the Preceding Year.	New Patients.	Total.	Total Number of Days' Sickness.	Average Number sick per Day.	Ratio per 1,000 of Force per Day.
1901.....	26,469	1,317	23,637	24,954	584,865	1,602.4	60.5
1902.....	30,445	1,254	24,416	25,670	620,686	1,700.5	55.9
1903.....	31,583	1,209	27,633	28,842	703,534	1,927.5	61.0

It is quite usual that there should be more or less fluctuation in the number of the sick from year to year: the great increase in the members for the year 1903 can easily be accounted for. Details will be found below in the table showing the classes of their diseases :—

CLASSIFIED DISEASES OF YEARLY PATIENTS IN THE WHOLE NAVY.

Year.	General Diseases	Diseases of the Nervous System.	Diseases of the Respiratory System	Diseases of the Circulatory System.	Diseases of the Digestive System.	Diseases of the Urinary and Generative Systems	Veneral Diseases	Diseases and Injuries of the Eye.	Diseases and Injuries of the Ear.	Diseases of the Skin and Connective Tissue.	Diseases of the Organs of Locomotion.	Injuries.	Other Diseases and Wounds.	Total
1901...	1,609	230	1,928	209	5,025	456	5,926	1,420	358	3,016	349	4,392	36	24,954
1902 ..	1,421	341	1,979	196	5,713	435	5,452	1,502	357	3,309	400	4,538	27	25,670
1903 ..	1,311	315	2,161	201	6,228	420	7,067	1,468	428	3,336	449	5,399	59	28,842

The above table shows a general increase in the year 1903, with a slight decrease in the general diseases and a small fluctuation in the diseases of the circulatory system, urinary and generative systems, ophthalmic and skin diseases—the increases being considerably greater in the diseases of digestive system, venereal diseases and injuries. Such an increase is but the natural consequence from the increase of the men of the Navy in that year over those of the preceding years; but an excess over the current rate is recognizable in the increase of diseases of the digestive tract, of injuries and especially of venereal diseases. This seems attributable to the fact that towards the end of that year the friendly relation between Russia and Japan being about to be broken, and the exercises of our men, such as practical training had grown very brisk. Everybody was expecting the word of command to start for a campaign from which they were determined never to return alive, and most of the men naturally plunged into unwholesome indulgences on shore. The consequence was a remarkable increase in the number of cases of injury, of diseases of the digestive tract, and of venereal diseases. Such was the general condition of health in the whole Navy; and the same is also observable for the force afloat, as shown below:—

YEARLY NUMBER OF SICK AMONG THE FORCE AFLOAT.

(All above warrant officers excluded.)

Year.	Average Force.	Patients Remaining from the Preceding Year.	New Patients.	Total.	Total Number of Days' Sickness.	Average Number sick per Day.	Ratio per 1,000 of Force per Day.
1901	15,128	536	15,614	16,150	265,521	754.9	49.9
1902	16,584	439	15,276	15,715	280,539	768.6	46.4
1903	18,090	448	18,829	19,277	328,637	900.4	49.8

CLASSIFIED DISEASES OF YEARLY PATIENTS AMONG
THE FORCE AFLOAT.

Year.	General Diseases.	Diseases of the Nervous System.	Diseases of the Respiratory System.	Diseases of the Circulatory System.	Diseases of the Digestive System.	Diseases of the Urinary and Generative Systems.	Veneral Diseases.	Diseases and Injuries of the Eye.	Diseases and Injuries of the Ear.	Diseases of the Skin and Connective Tissue.	Diseases of the Organs of Locomotion.	Injuries.	Other Diseases and Wounds.	Total.
1901...	1,100	112	1,193	106	3,592	300	3,631	759	217	1,761	206	3,178	15	16,170
1902...	851	153	1,112	108	3,831	232	3,317	709	200	1,939	246	3,136	17	15,851
1903 ..	952	185	1,293	124	4,330	276	4,859	908	241	2,117	289	3,866	37	19,477

N.B. The difference in the totals of the above table from those of the preceding one is due to the fact that in this table those men transferred from their ships to shore stations or land are reckoned as ships' patients, according to the locality of occurrences of such cases.

Further we give a classified table of diseases of new patients in each ship of the fleet before the war :—

Names of Ships.	General Diseases.	Diseases of the Nervous System.	Diseases of the Respiratory System.	Diseases of the Circulatory System.	Diseases of the Digestive System.	Diseases of the Urinary and Generative Systems.	Veneral Diseases.	Injuries and Diseases of the Eye.	Injuries and Diseases of the Ear.	Diseases of the Skin and Connective Tissue.	Diseases of the Organs of Locomotion.	Injuries.	Other Wounds and Diseases.	Total
<i>Mikasa</i>	1	1	3	1	30	1	25	1	—	3	1	19	—	86
<i>Asahi</i>	2	—	9	1	15	—	21	—	—	5	1	14	—	68
<i>Fuji</i>	—	—	2	—	12	—	22	—	—	11	1	16	—	64
<i>Yashima</i>	1	—	8	—	23	—	18	2	1	5	—	12	—	75
<i>Shikishima</i>	5	—	2	—	20	1	20	2	2	16	5	22	—	95
<i>Hatsuse</i>	—	—	2	—	2	—	16	1	—	2	1	14	—	38
<i>Idzumo</i>	—	—	1	—	8	—	22	—	—	9	1	21	—	62
<i>Adzuma</i>	—	—	1	1	12	—	19	2	—	10	—	15	—	60
<i>Asama</i>	1	—	6	1	8	2	28	3	—	3	—	8	—	60
<i>Yakumo</i>	3	—	3	1	8	—	40	1	—	5	—	11	—	72
<i>Tokima</i>	3	—	2	—	3	—	14	1	—	7	—	10	—	40
<i>Iwate</i>	—	2	5	—	9	1	7	1	2	5	1	34	—	67

<i>Chitose</i>	2	1	—	—	11	1	19	1	—	1	3	12	—	51
<i>Takasago</i>	1	—	4	—	6	1	22	—	—	7	—	12	—	53
<i>Kasagi</i>	—	—	—	2	1	1	10	1	—	—	—	5	—	20
<i>Yoshino</i>	—	—	3	—	10	—	23	2	1	5	1	17	—	62
<i>Naniva</i>	—	1	2	—	8	—	9	1	1	7	—	11	—	40
<i>Akashi</i>	—	—	1	—	3	1	6	—	—	—	—	—	—	11
<i>Takachiho</i>	—	—	1	—	3	—	12	3	1	2	—	7	—	29
<i>Niitaka</i>	—	—	—	—	6	—	1	—	2	3	—	5	—	17
<i>Chinyen</i>	—	—	5	—	10	—	14	—	—	5	3	9	—	46
<i>Fuso</i>	—	—	1	1	1	—	8	—	—	—	—	6	—	17
<i>Matsushima</i>	—	—	1	—	3	1	9	—	—	5	1	9	—	29
<i>Itsukushima</i>	1	—	8	1	1	—	6	2	—	2	1	10	—	32
<i>Hachidate</i>	15	—	3	—	10	2	13	2	—	1	1	15	—	62
<i>Akitsushima</i>	3	—	2	—	10	—	5	—	—	4	1	8	—	33
<i>Idzumi</i>	1	—	—	—	5	1	7	—	—	9	—	13	—	36
<i>Chiyoda</i>	1	—	1	—	—	—	14	1	1	1	—	4	—	23
<i>Sama</i>	1	—	2	1	2	—	8	—	1	2	—	15	—	32
<i>Saiyen</i>	—	—	9	—	7	—	13	2	—	2	—	6	—	39
<i>Tsukushi</i>	—	—	1	—	4	—	9	—	3	1	—	3	—	21
<i>Atago</i>	1	—	1	—	1	—	4	—	—	1	—	—	—	8
<i>Maya</i>	1	—	1	—	4	—	2	—	—	—	—	2	—	10
<i>Chokai</i>	—	—	—	1	7	—	4	2	—	2	—	5	—	21
<i>Uji</i>	1	—	1	—	2	—	1	—	—	1	—	—	—	6
<i>Heiyen</i>	2	—	1	—	5	—	2	1	—	—	—	5	—	16
<i>Kaimon</i>	1	—	2	—	1	1	4	—	—	6	—	6	—	21
<i>Banjo</i>	—	1	—	—	6	1	8	2	—	5	1	4	—	28
<i>Ta'suta</i>	—	—	—	—	3	—	2	3	—	6	—	3	—	17
<i>Chikaya</i>	—	—	—	—	6	—	3	1	—	2	—	5	—	17
<i>Oshima</i>	—	1	—	1	7	1	3	2	—	2	—	5	—	22
<i>Akagi</i>	—	1	3	—	4	—	3	1	—	2	1	8	—	23
<i>Miyato</i>	2	—	1	—	5	—	8	2	—	2	—	8	—	28
I Destroyer Division	—	—	1	2	5	—	7	—	—	5	—	9	—	29
II Destroyer Division	—	—	2	—	5	1	7	—	—	3	—	8	—	26
III Destroyer Division	1	1	4	—	5	—	10	1	—	4	1	3	—	30
IV Destroyer Division	1	—	—	—	3	—	13	1	—	1	—	4	—	23
V Destroyer Division	—	—	7	—	13	—	5	2	1	5	1	13	—	47
General Total	51	9	112	14	338	17	546	47	16	185	26	451	—	1,812

N.B. In this table only such cases are reckoned as occurred from Jan. 1 to Feb. 5, 1904.

CHAPTER II.

CONDUCT OF OUR SQUADRON AT THE FRONT AND ABOUT THE WEATHER.

Before speaking about the sanitary condition of our fleet at the front, it may be necessary to make a statement about the course of action taken by our squadrons; for details we refer our readers to some of the many narratives of the war: in this work, we must confine ourselves to a mere résumé.

On February 6, 1904, our squadron left Sasebo for the Korean waters. Having destroyed the enemy's ships off Chemulpo, and made a surprise attack upon the enemy's ships in the roadstead outside the harbour of Port Arthur, it devoted its energies principally to covering the landing of our Army on Korean soil, keeping its base towards the western coast of Korea, and not unfrequently challenging the enemy's ships at Port Arthur. This continued till the end of April, and at the beginning of May we pushed our base forward to the Li-chang-shan-li-ch-tao sending a detached force to render assistance during the landing of our army on Liao-tung Peninsula and to make a reconnaissance in force along the whole coast, the main force in the meanwhile acting chiefly off Port Arthur, occupying Siao-ping-tao and Talien Bay and blockading Port Arthur. On August 10 there was a naval engagement in the Yellow Sea, in which the enemy's ships were fairly repulsed and the greater part of them forced to take refuge within the port. Then our fleet co-operated with our Army in the attack upon the enemy's fortress and succeeded at last in seeing the fortress fall and the fleet annihilated. In the meanwhile a part of our fleet maintained itself near Tsushima in wait for an attack upon the Vladivostock Squadron, while devoting some part of its time on escort duty for our Army in North Korea. This squadron ultimately destroyed the Vladivostock Squadron off Ulsan on August 14, at the same time capturing many smuggling vessels. Thus ended the first period of the Naval War; after which, a sufficient force being left to keep watch off Port Arthur and Tsushima, the greater portion of our fleet went home for repairs in order to be ready for

the on-coming of the Second Russian Pacific Squadron. Another portion, however, was sent northward to guard the Tsugaru Strait, and to lie in wait for any southward movement on the part of the Vladivostok Squadron. Another detachment also was sent southward to search for news of the enemy's whereabouts. This was repeated twice. When at last the news was received that the enemy's squadron was coming eastward upon us, almost the whole of our fleet collected itself about the Korean Straits between March and April, 1905; where with the utmost secrecy and precaution it lay in wait for the attack. In the encounter that ensued on May 27 in the Japan Sea, we gained a victory such as the world had rarely before witnessed, and grasped the complete supremacy of the Eastern Seas.

The second period having thus been brought to conclusion, we entered upon the third period, when our fleet was parted into two divisions, the first half keeping guard over the Korean Strait, while the other half went northward to co-operate with our Army, fulfilling its duty in the successful occupation of Sakhalin. And thus the great crisis was brought to an end.

To sum up, the main force of our Navy during the first period cruised off the west coast of Korea and of the Liao-tung Peninsula, while a division acted off Tsushima and North Korea.

In the second period one division of our fleet cruised as far south as South China and the Southern Ocean; another division lay off our northern coast; but by far the greater part of the rest hovered around Tsushima and Chin-hai Bay.

The third period saw our fleet separated into two parts, the first half keeping itself near the Korean Strait as before, while the other half went towards Sakhalin and acted off the island and near the shores of the Okhotsk Sea. Later on, from September, 1905, the greater part of our active fleet lay low, near the coast of Japan.

The atmospheric phenomena of the locality traversed by our fleet in action during these periods are briefly as follows: The climate of Korea is exceedingly varied owing to the configuration of the land and to the monsoons. Southward from its central portion, the climate is almost the same as that of Japan proper, the only difference between it and our coast land lying in the excessive variations

of temperature of day and night and a great changeableness of the weather in the former. In summer a south-east wind prevails: it is intensely hot and moist, while in winter when a north-west wind blows for the most part, the cold is severe and dry. In the northern portion, the severity of the cold is just as great as on the northern coast of Liao-tung. The coast of Liao-tung in general has its climate tempered by marine influences, but as we advance further into the interior of Manchuria the climate grows more continental; and in winter the atmospheric pressure rises to a remarkable degree; not unfrequently reaching as high as over 780 millimetres. If at such a time a low pressure from the south should come on, the inclination of the aerial strata will grow so acute and precipitating as to cause an excessive dryness and a violent wind blowing day after day. Such an aspect of nature is often met with during a severe winter. In the province of Kwang-tung, too, where one would expect the weather to be comparatively mild and warm, the temperature will fall to 17° or 18°, or even 20° F. below the freezing,—a part of the sea surface will be frozen up, and liquids kept for every day use in a room will be congealed. There is a local saying: “Three colds and four warmths” i.e. three days of excessive cold followed by four days of mild and comparatively warm weather. This atmospheric disposition differs from year to year—coming sometimes earlier and sometimes later; but it generally sets in during October or November, and ends in March or April of the next year—being severest during the period from the middle of January to the middle of February.

As the winter season passes away, the temperature rises suddenly and the rainfall gradually increases—measuring about one half of its average annual amount of precipitation—during the two months of July and August—the wettest and most gloomy season of the year, though by no means so wet as the rainy season in Japan proper. The temperature begins to rise considerably from June till August when the heat is most intense, often reaching as high as about 90° F. in the coast district of Liao-tung Peninsula, though but for a short time in the day. Compared with the interior of Japan the hot season is shorter; and as early as the middle of September the autumn coolness is already felt, while in October, chilly cold is sometimes experienced more intense than that in the severest of winter in the district facing our inland sea of Seto. In spring too, high atmos-

pheric pressures still continue and it frequently happens that the temperature gets even lower than that of the cold season in the middle portion of our country—the snow falling on some twenty or thirty days from the middle of October to the end of March—but the amount being generally much smaller, barely sufficient to cover the ground.

The direction of wind of course varies with the change of atmospheric pressure, the north being the most prevalent wind in winter and the south in summer. The number of stormy days and the velocity of the wind are both greater along the coast, the most violent wind blowing in winter when the cold is severest.

The sphere in which portions of our fleet moved was not limited to the above districts; but extended far into the southern ocean where our men were exposed to the furnace-like heat of the torrid zone, while another part went as far north Kunajiri Strait where, shut in by floating masses of ice, and snow storms, they experienced the hardships of an almost Arctic cold. Sakhalien, being near the frigid zone, has a shocking climate,—there is much moisture and it is remarkably foggy and rainy in summer and equally snowy in winter when the cold is intense to an extreme. But the season during which our ships operated in this quarter was summer; the cold was not very great and the air was comparatively free from fogs.

In short the sphere in which our fleet moved and operated during the twenty months of the war extended from the torrid zone of burning heat on the south and past the coasts of China and Korea up to the frigid zone of the north with its piercing cold winds. The incessant and sudden changes of temperature that our men had to face from the beginning to the last—from the severest of cold to the most intense heat—were quite out of comparison with anything in the interior of Japan; and the effect produced upon the health of our fighting men was very great.

Below we give weather charts from the flag-ships of Commanders-in-Chief of the First, Second, and Third Squadrons as also those from some ships engaged on special service:—

WEATHER CHART.—

(Feb. 6, 1904—

Year & Month.		February (from 6 of the Month) 1904.			March.			April.		
Period of ten Days in Month.		First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Locality.		Sasebo, Port Arthur, Asan.	Asan. The south-western Coast of Korea.	Simi-to, Port Arthur. The south-western Coast of Korea.	The south-western Coast of Korea. Simi-to.	Port Arthur, Simi-to. The north-western Coast of Korea.	Simi-to, Port Arthur. The north-western Coast of Korea.	The north-western Coast of Korea.	The north-western Coast of Korea.	The north-western Coast of Korea.
Weather at Noon. (The unit of number is day.)	Clear.	3	6	7	4	7	6	7	8	4
	Overcast.	2	3	2	5	3	5	2	2	5
	Rainy.	—	—	—	—	—	—	—	—	1
	Snowy.	—	1	—	1	—	—	—	—	—
	Foggy.	—	—	—	—	—	—	1	—	—
Air Pressure. (Inch.)	Max.	30.35	30.42	30.54	30.47	30.48	30.30	30.42	30.46	30.24
	Min.	29.87	29.88	29.88	29.78	30.09	29.87	29.59	29.97	29.90
Difference between Dry and Wet Bulb Thermometers. (°F.)	Max.	10	8	11	7	7	6	7	7	10
	Min.	1	0	1	1	0	0	1	1	0
	Mean.	3.9	2.7	2.9	2.7	2.9	2.3	3.2	3.2	3.3
Most Prevalent Direction of the Wind.		N.W.	N.W.— S.E.	N.E.— S.E.	N.E.— S.W.	N.E.— N.W.	N.W.— S.W.	S.W.	N.E.	N.E.— S.W.
Strength of the Wind.	6 and upward.	1	—	—	1	—	—	1	—	—
	5—4.	2	2	2	2	1	1	—	—	—
	3—2.	2	3	5	3	5	3	1	4	—
	1—0.	—	5	2	4	4	7	8	6	10
Air Temperature. (°F.)	Max.	58	48	58	55	47	53	59	63	65
	Min.	30	24	29	32	28	39	40	43	49
	Mean.	44.6	39.4	39.1	42.3	37.5	43.2	48.4	50.2	52.8

Shikishima.

Oct. 15, 1905.)

May.			June.			July.			August.		
First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
The north-western Coast of Korea. Port Arthur. Li-chang-shan-li-ch-tao. Ochang-tao.	Li-chang-shan-li-ch-tao. Port Arthur. Kwang-lu-tao.	Li-chang-shan-li-ch-tao.	Li-chang-shan-li-ch-tao.	Li-chang-shan-li-ch-tao.	Chang-tze-tao.	Chang-tze-tao. Li-chang-shan-li-ch-tao.	Li-chang-shan-li-ch-tao.	Li-chang-shan-li-ch-tao. Chang-tze-tao. Port Arthur. Yüen-tao.	Li-chang-shan-li-ch-tao. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.
5	6	7	5	3	6	4	3	2	9	4	9
3	2	4	2	4	—	3	5	4	1	4	2
—	—	—	—	1	1	—	1	2	—	2	—
—	—	—	—	—	—	—	—	—	—	—	—
2	2	—	—	2	3	3	1	3	—	—	—
30.12	30.19	30.09	29.95	29.99	29.99	29.99	30.10	30.05	30.00	30.09	30.12
29.91	29.72	29.72	29.61	29.61	29.58	29.60	29.74	29.68	29.63	29.60	29.73
10	13	9	14	11	10	13	12	5	6	10	8
1	1	1	1	1	1	1	0	0	1	1	2
4.0	6.8	3.5	4.9	3.8	3.9	3.7	3.3	2.2	2.9	3.5	4.3
S.W.	S.E.— S.W.	S.E.— S.W.	S.E.	S.E.	S.E.— S.W.	S.E.— N.E.	S.E.— S.W.	S.	S.E.	S.W.— S.E.	S.W.
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	2	—	—	—	—	1	—
8	4	5	1	2	2	2	1	4	7	5	3
2	6	6	9	8	6	8	9	7	3	4	8
71	70	68	78	78	79	84	84	81	83	89	87
48	52	56	59	63	64	67	70	71	75	73	73
55.6	59.5	61.0	67.1	68.4	70.5	78.0	73.4	76.4	78.8	77.8	78.2

WEATHER CHART.—

(Feb. 6, 1904.—

Year & Month.		September.			October.			November.		
Period of Ten Days in Month.		First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Locality.		Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.	Port Arthur. Yüen-tao.
Weather at Noon. (The unit of number is day.)	Clear.	7	9	9	7	7	8	9	7	9
	Overcast.	3	1	1	3	3	3	1	2	1
	Rainy.	—	—	—	—	—	—	—	—	—
	Snowy.	—	—	—	—	—	—	—	—	—
	Foggy.	—	—	—	—	—	—	—	1	1
Air Pressure. Inch.)	Max.	30.23	30.21	30.28	30.56	30.44	30.50	30.39	30.49	30.59
	Min.	29.87	29.86	29.91	30.03	29.92	30.15	30.05	30.04	30.05
Difference between Dry and Wet Bulb Thermometers (°F.)	Max.	12	11	11	11	8	11	11	6	8
	Min.	1	1	2	3	1	3	2	1	2
	Mean.	5.7	5.6	6.3	5.5	4.1	6.5	4.8	3.0	3.5
Most Prevalent Direction of the Wind.		S.W. — N.W.	W.N. W.	N.W. — S.W.	N.N.E. — N.W.	N.N.E. — S.S.W.	N.E. — S.W.	N.W. — S.W.	N.W.	N.W. — N.E.
Strength of the Wind.	6 and upward.	—	1	—	2	2	—	1	3	2
	5—4.	2	1	—	4	1	6	4	3	7
	3—2.	6	7	7	3	7	4	5	4	1
	1—0.	2	1	3	1	—	1	—	—	—
Air Temperature. (°F.)	Max.	81	83	78	80	75	65	64	59	55
	Min.	73	62	60	52	54	46	41	34	35
	Mean.	77.2	75.0	71.6	65.7	64.1	55.1	56.0	49.0	46.5

Shikishima.

Oct. 15, 1905.)

December.			January. (1905).			February.			March.		
First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Yüen-tao—Kure.											
Kure.											
Kure, Hiroshima Bay, Sasebo.			Kuba Bay, Sasebo	Sasebo.	Sasebo.	Sasebo, Chin-hai Bay.	Chin-hai Bay, Sasebo.	Chin-hai Bay, Ozaki Bay, Chin-hai Bay.	Chin-hai Bay.	Chin-hai Bay.	Chin-hai Bay, Douglas Inlet.
9	4	8	7	3	2	9	9	4	6	4	3
1	6	2	2	6	7	1	1	2	3	6	4
—	—	1	1	1	2	—	—	2	1	—	3
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	1
30.34	30.30	30.46	30.56	30.49	30.20	30.28	30.35	30.28	30.48	30.39	30.30
30.09	30.03	30.12	30.02	29.80	29.69	29.96	30.02	29.92	30.14	29.92	29.83
11	10	8	10	10	9	10	9	8	8	8	8
1	2	1	1	1	1	0	1	1	1	1	0.5
4.5	3.9	4.0	3.7	3.9	3.8	3.9	4.2	3.4	4.4	4.3	3.1
N.W.— S.W.	W.S.W.— N.E.	Un- certain.	N.W.— S.E.	N.W.— S.E.	S.E.— N.W.	N.W.— N.	N.W.— S.W.	N.— N.N.W.	N.W.— N.	N.W.— N.E.	N.E.— E.
—	—	—	—	—	—	—	—	1	—	—	1
1	1	1	—	—	1	1	1	2	—	—	6
2	2	4	1	3	7	8	8	4	6	7	2
7	7	6	9	7	3	1	1	1	4	3	2
69	68	58	62	64	66	59	55	54	60	60	64
43	39	38	41	44	39	24	34	36	31	38	45
56.4	51.9	46.9	52.4	53.6	50.7	41.5	44.2	47.4	44.6	49.8	53.4

WEATHER CHART.—

(Feb. 6, 1905.—

Year & Month.		April.			May.			June.		
Period of Ten days in Month.		First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Locality.		Chin-hai Bay, Douglas Inlet	Chin-hai Bay.	Chin-hai Bay.	Chin-hai Bay.	Chin-hai Bay.	Chin-hai Bay, Douglas Inlet, Japan Sea, Sascho.	Sascho.	Sascho, Kure.	Kure.
Weather at Noon. (The unit of number is day.)	Clear.	7	4	5	4	4	5	3	1	3
	Overcast.	1	5	3	5	4	3	4	5	4
	Rainy.	2	1	2	1	1	3	3	4	3
	Snowy.	—	—	—	—	—	—	—	—	—
	Foggy.	—	—	—	—	1	—	—	—	—
Air Pressure. (Inch.)	Max.	30.38	30.15	30.45	30.40	30.36	30.08	30.10	29.90	30.10
	Min.	29.84	29.50	29.67	29.67	29.72	29.50	29.63	29.64	29.64
Difference between Dry and Wet Bulb Thermometers. (°F.)	Max.	10	10	9	10	8	10	10	8.5	10
	Min.	1	0	1	1	0	1	1	0	1
	Mean.	3.5	3.6	3.7	4.6	3.2	4.2	3.5	2.3	3.4
Most Prevalent Direction of the Wind.		N.E.—S.W.	S.E.—N.E.	S.E.—N.W.	S.W.—S.E.	S.W.—S.E.	S.W.—N.W.	S.W.—N.W.	N.E.—S.W.	N.E.—S.W.
Strength of the Wind.	6 and upward.	—	1	—	1	—	—	—	—	—
	5—4.	1	—	—	1	1	2	1	—	—
	3—2.	4	3	5	3	1	5	—	2	—
	1—0.	5	6	5	5	8	4	9	8	10
Air Temperature. (°F.)	Max.	62	72	69	73	76	78	84	86	86
	Min.	45	54	48	56	59	62	65	66	69
	Mean.	55.2	60.9	58.6	64.9	68.1	67.7	74.2	74.5	74.4

Shikishima.

Oct. 15, 1905).

July.			August.			September.			October (till 15 of the Month).	
First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.
Kure.	Mitsugahama, Chin-hai Bay, Ozaki Bay.	Tozen, Mio Bay, Maidzuru, Miyadzu.	Setozaki, Chin-hai Bay, Sascho.	Sascho, Funakoshi-Bay, Fukuoka Bay.	Nagasaki, Kuroshima, Sascho, Imari.	Imari, Sascho.	Sascho.	Sascho.	Sascho.	Sascho, Tsu.
6	5	4	3	3	4	6	4	5	7	4
3	4	6	5	2	5	4	5	5	2	—
1	1	1	2	5	2	—	1	—	1	1
—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
30.02	30.05	29.98	29.98	30.01	30.09	30.14	30.09	30.22	30.28	30.27
29.82	28.97	29.61	29.17	29.49	29.74	29.62	29.90	29.94	29.95	30.03
7	5	10	8	7	6	10	11	12	15	10
0	0	1	1	0	0	1	0	1	1	2
2.9	2.4	3.9	3.1	3.1	3.0	4.2	4.4	6.4	6.5	5.9
N.E.— S.W.	S.W.— N.E.	S.E.— N.W.	S.W.— N.W.	S.W.— N.E.	N.E.— S.E.	S.E.— S.W.	S.W.— N.E.	N.E.— N.W.	N.E.— S.E.	N.E.— S.E.
—	1	—	1	—	—	1	—	—	—	—
—	—	1	1	3	—	1	—	—	—	1
—	5	5	6	1	3	1	2	2	1	3
10	4	5	2	6	8	7	8	8	9	1
89	89	90	85	87	86	87	88	82	80	79
69	73	74	72	72	72	74	68	61	61	65
79.9	80.5	80.8	78.7	78.9	78.6	81.1	79.4	72.8	70.7	71.5

WEATHER CHART.—

(Feb. 6, 1904—

Year & Month.		February (from 6 of the Month) 1904.			March.			April.		
Period of Ten Days in Month.		First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Locality.		Sascho, Port Arthur, Off Asan.	The south-western Coast of Korea, from Asan.	Sumi-to, Port Arthur. The south-western Coast of Korea.	The south-western Coast of Korea. Vladivostok, Sascho.	The north-western Coast of Korea, from Sascho.	Port Arthur. The north-western Coast of Korea.	The north-western of Korea.	Port Arthur. The north-western Coast of Korea. Chin-hai Bay.	Gensan, Vladivostok, Port Lazaref.
Weather at Noon. (The unit of number is day.)	Clear.	4	4	8	6	8	10	8	7	5
	Overcast.	1	5	—	3	2	—	1	2	—
	Rainy.	—	—	1	1	—	—	1	1	—
	Snowy.	—	1	—	—	—	—	—	—	—
	Foggy.	—	—	—	—	—	1	—	—	5
Air Pressure. (Inch.)	Max.	30.28	30.32	30.47	30.32	30.45	30.28	30.37	30.41	30.23
	Min.	29.86	29.89	29.84	29.52	29.99	29.83	29.74	29.96	29.80
Difference between Dry and Wet Bulb Thermometers. (°F.)	Max.	9	3	5	7	7	4	7	5	6
	Min.	1	0	0	0	1	1	0	1	0
	Mean.	3.8	1.6	2.2	2.0	3.1	2.1	2.6	2.4	2.2
Most Prevalent Direction of the Wind.		N.— N.W.	N.— N.W.	S.E.— N.W.	N.W.— S.E.	N.—N.E. —N.W.	N.W.— S.E.	W.— S.W.	N.E.	S.— S.W.
Strength of the Wind.	6 and upward.	—	—	1	1	—	—	—	—	—
	5—4.	1	5	1	1	1	2	2	3	—
	3—2.	3	2	5	6	6	2	1	5	6
	1—0.	1	3	2	2	3	7	7	2	4
Air Temperature. (°F.)	Max.	50	54	57	56	60	52	57	62	66
	Min.	23	28	25	18	31	33	42	44	47
	Mean.	36.5	41.5	40.3	38.8	45.8	44.6	53.6	53.0	54.9

Idzumo.

Oct. 15, 1905.

May.			June.			July.			August.		
First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Port Lazaref, Chin-hai Bay, Takeshiki.	Ozaki Bay.	Ozaki Bay, and its Neighbouring Sea.	Ozaki Bay.	Ozaki Bay. Off Gen-san.	Ozaki Bay.	The Tsushima Strait. Gen-san. Ozaki Bay.	The Tsushima Strait. Ozaki Bay.	Ozaki Bay.	Ozaki Bay.	Ozaki Bay.	Ozaki Bay.
9	7	9	7	8	8	8	5	10	10	7	9
—	—	—	1	—	1	2	—	—	—	—	2
1	2	2	1	2	1	—	4	1	—	2	—
—	—	—	—	—	—	—	—	—	—	—	—
—	1	—	1	—	—	—	1	—	—	1	—
30.19	30.21	30.09	30.04	29.97	30.06	29.95	30.05	30.15	30.04	30.13	30.06
29.79	29.58	29.63	29.70	29.53	29.80	29.57	29.80	29.77	29.77	29.33	29.65
9	7	8	8	7	7	5	7	7	9	9	8
1	0	1	1	0	0	0	0	1	2	1	1
3.8	2.9	3.7	3.3	3.1	2.7	2.4	2.1	3.1	4.1	4.3	3.4
S.W.— S.E.	S.W.— S.E.	N.E.— S.W.	S.W.— S.S.W.	S.W.— S.E.	S.W.— S.E.	N.E.	E.N.E.— N.E.	S.W.— N.W.	N.E.— S.W.	S.W.— S.E.	N.E.
—	—	—	—	—	—	—	2	—	—	1	—
2	3	—	2	1	2	3	1	4	1	1	2
2	3	7	5	6	3	2	5	6	8	2	7
6	4	4	3	2	5	5	2	1	1	6	2
69	73	72	78	81	83	85	84	87	87	87	85
54	58	63	63	63	68	71	71	78	77	77	77
64.2	64.2	65.5	71.8	71.4	75.0	77.7	76.6	81.5	82.7	82.6	79.5

WEATHER CHART.—

(Feb. 6, 1904—

Year & Month.		September.			October.			November.		
Period of Ten Days in Month.		First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Locality.		Ozaki Bay.	Ozaki Bay, Sascho.	Ozaki Bay.	Chin-lai Bay from Ozaki Bay.	Ozaki Bay, The Tsushima Strait.	Ozaki Bay.	Ozaki Bay.	Ozaki Bay.	Ozaki Bay.
Weather at Noon. (The unit of number is day.)	Clear.	9	8	9	8	7	10	10	8	10
	Overcast.	1	1	1	1	2	1	—	1	—
	Rainy.	—	1	—	1	1	—	—	1	—
	Snowy.	—	—	—	—	—	—	—	—	—
	Foggy.	—	—	—	—	—	—	—	—	—
Air Pressure. (Inch.)	Max.	30.17	30.02	30.21	30.43	30.37	30.28	30.23	30.41	30.35
	Min.	29.75	29.52	29.85	29.85	29.81	29.91	29.91	29.93	29.86
Difference between Dry and Wet Bulb Thermometers. (°F.)	Max.	8	6	10	9	7	12	9	6	7
	Min.	1	1	2	2	1	2	2	1	2
	Mean.	3.7	3.5	5.8	3.8	3.2	3.9	4.2	3.5	3.8
Most Prevalent Direction of the Wind.		S.W.— N.E.	N.E.— N.	N.W.— N.E.	N.E.— N.	E.N.E.— N.	N.N.W.— N.W.	N.W.— W.	N.W.	N.W.— N.E.
Strength of the Wind.	6 and upward.	—	—	—	—	—	—	—	—	—
	5—4.	—	2	—	—	2	1	2	1	3
	3—2.	5	7	5	8	2	6	4	5	5
	1—0.	5	1	5	2	6	4	4	4	2
Air Temperature. (°F.)	Max.	84	84	76	76	74	71	68	73	66
	Min.	73	70	67	63	63	55	51	45	51
	Mean.	77.2	77.0	72.2	68.4	69.2	57.0	59.0	57.8	56.5

Idzumo.

Oct. 15, 1905)

December.			January. (1905.)			February.			March.		
First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Ozaki Bay.	Sascho. Ozaki Bay.	Sascho.	Ozaki Bay.	Ozaki Bay.	Ozaki Bay.	Sascho. Chin-hai Bay. Gen-san.	Chin-hai Bay.	Chin-hai Bay. Gen-san.	Song-jin Bay. Chin-hai	Chin-hai Bay.	Chin-hai Bay.
8	4	9	7	6	4	10	10	5	9	4	5
1	4	1	3	3	4	—	—	1	1	5	3
1	2	1	—	1	1	—	—	—	—	1	2
—	—	—	—	—	2	—	—	2	—	—	1
—	—	—	—	—	—	—	—	—	—	—	—
30.30	30.25	30.46	30.47	30.24	30.06	30.12	30.24	30.34	30.38	30.33	30.23
29.98	30.00	29.96	29.89	29.72	29.58	29.88	29.94	29.86	30.02	29.62	29.81
6	7	7	7	8	8	9	10	10	8	9	9
1	1	1	1	0	1	0	0	0	1	2	1
3.3	3.1	3.7	3.7	3.8	3.7	3.7	4.5	4.1	4.8	4.4	3.5
N.N.W.—S.W.	W.—N.	N.W.	N.W.	S.E.—N.W.	N.E.—N.W.	N.W.—S.W.	N.W.—W.	N.—N.E.	N.N.W.—N.	N.W.—N.E.	N.E.
—	—	—	—	—	—	—	—	—	—	—	3
—	2	—	—	—	1	6	3	—	2	1	4
6	5	7	2	2	7	3	5	7	5	4	3
4	3	4	8	8	3	1	2	1	3	5	1
70	62	57	63	63	61	55	50	53	57	57	63
51	43	41	43	45	41	18	28	32	23	41	46
57.8	50.8	46.5	51.7	53.2	51.2	24.5	41.5	40.2	48.0	49.1	53.0

WEATHER CHART.—

(Feb. 6, 1904.—

Year & Month.		April.			May.			June.		
Period of Ten Days in Month.		First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.
Locality.		Chin-hai Bay.	Chin-hai Bay. Vladivostok.	Chin-hai Bay.	Chin-hai Bay.	Chin-hai Bay.	Sasbo from Chin-hai Bay.	Chin-hai Bay.	Chin-hai Bay. Nagasaki.	Nagasaki.
Weather at Noon. (The unit of number is day.)	Clear.	8	5	5	7	6	7	8	5	5
	Overcast.	1	2	3	2	2	2	1	2	3
	Rainy.	1	2	2	1	1	2	1	3	2
	Snowy.	—	1	—	—	—	—	—	—	—
	Foggy.	—	—	—	—	1	—	—	—	—
Air Pressure (Inch.)	Max.	30.29	30.11	30.29	30.28	30.32	30.03	29.92	29.76	29.90
	Min.	29.79	29.48	29.63	29.62	29.68	29.47	29.53	29.54	29.49
Different between Dry and Wet Bulb Thermometers. (°F)	Max.	10	10	9	11	8	9	9	9	10
	Min.	1	0	0	1	1	1	0	1	0
	Mean.	5.3	3.3	4.2	4.9	4.3	4.9	3.9	3.5	4.0
Most Prevalent Direction of the Wind.		N.W.— N.E.	N.E.— S.W.	N.N.W.— S.W.	S.W.— S.	S.— S.W.	S.W.— S.	S.W.— S.E.	N.E.— S.E.	E.W.— N.
Strength of the Wind.	6 and upward.	—	1	—	1	—	1	2	—	—
	5—4.	—	4	3	1	1	4	—	1	—
	3—2.	6	2	3	4	3	2	6	5	2
	1—0.	4	3	4	4	6	4	2	4	8
Air Temperature. (°F.).	Max.	64	64	68	70	74	76	76	79	76
	Min.	44	41	48	58	61	61	62	99	68
	Mean.	53.5	52.7	56.5	63.8	66.9	66.6	69.7	73.5	72.3

Idzumo.

Oct. 15, 1905.)

July.			August.			September.			October (till 15 of the month.)	
First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.	Last.	First.	Middle.
Nagasaki.	From Nagasaki to Chin-hai Bay and Song-jin touching Sasabo.	Ozaki Bay.	Ozaki Bay.	Chin-hai Bay. Song-jin.	Ozaki Bay.	Chin-hai Bay.	Chin-hai Bay. Sasabo.	Sasabo.	Sasabo.	Kure. Tsu.
7	6	3	7	8	6	7	9	10	9	4
2	4	2	1	1	4	1	1	—	—	—
1	—	5	2	1	1	2	—	—	1	1
—	—	—	—	—	—	—	—	—	—	—
—	—	1	—	—	—	—	—	—	—	—
29.98	29.95	29.85	29.86	30.00	30.12	30.00	30.04	30.12	30.18	30.23
29.79	29.39	29.31	28.44	29.54	29.60	29.35	29.84	29.93	29.84	30.07
10	6	9	7	7	8	10	12	13	11	10
1	1	1	1	1	2	1	1	0	2	2
4.8	5.0	3.6	3.6	3.9	4.2	4.6	5.6	5.7	6.6	5.1
S.— S.W.	S.W.— N.E.	S.W.	S.E.— S.W.	S.W.— S.E.	S.E.— S.W.	S.W.— S.E.	N.E.— S.W.	S.W.— N.	S.E.— N.W.	N.W.— S.E.
—	—	2	2	—	—	2	—	—	—	—
—	2	5	3	5	1	3	1	—	—	—
4	4	2	3	5	5	3	4	2	4	4
6	4	2	2	—	5	2	5	8	6	1
87	84	83	83	81	84	82	88	81	78	76
72	68	73	73	68	74	74	71	61	62	62
79.5	73.4	78.4	78.9	74.1	76.7	77.6	76.1	73.2	70.4	71.7

WEATHER CHART.—*Yakumo*, WHILE CRUISING

(Feb. 9—26,

Day.			9	10	11	12	13	14
Weather.			Clear.	Cloudy, and then Rainy.	Clear.	Clear.	Clear.	Clear.
Air Pressure. (Inch.)		Max.	29.60	29.65	29.68	29.81	29.91	29.97
		Min.	29.52	29.55	29.57	29.69	29.84	29.88
Air Temperature. (°F)	Poop Deck. (upper.)	Max.	29.0	23.0	20.5	21.0	21.0	18.0
		Min.	18.5	16.0	11.5	12.0	10.0	10.0
	Chart Room.	Max.	30.0	29.0	21.5	22.0	27.0	26.0
		Min.	20.0	20.5	14.0	14.0	13.0	13.0
Temperature of Sea Water. (°F.).		Max.	—	—	37	32	34	—
		Min.	—	—	29	20	32	—
Wind.	Most Prevalent Direction of.		N.W.	Uncertain.	N.W.	Northerly.	Westerly.	Northerly.
	Strength of.		1—5	1—4	1—4	1—3	1—2	1—3
Remarks.			Departed from Hakodate at 3 p.m. for Shiranuka Bay.	At 3 p.m. departed from 42.°, 56.′ N. Lat. 146.° 36.′ E. Long. amid masses of ice.	At 3.42 p.m. entered Shiranuka Bay.	Anchored in Shiranuka Bay.	Shiranuka Bay; cruised in the Kunaſiri Channel.	Shiranuka Bay.

ABOUT THE KUNAJIRI CHANNEL.

1905.)

15	16	17	18	19	20	21	22	23	24	25	26
Clear.	Clear.	Clear. Snowy later.	Snowy.	Clear.	Clear.	Clear.	Clear.	Clear. snowy later.	Clear.	Snowy.	Clear.
29.95	29.88	29.67	29.78	29.90	29.81	29.54	29.70	29.81	29.99	30.24	30.42
29.87	29.74	29.42	29.42	29.87	29.60	29.51	29.54	29.61	29.73	30.03	30.32
23.5	26.0	27.0	25.0	25.5	24.0	19.0	20.5	20.0	24.0	20.5	24.0
12.0	20.0	21.0	15.5	11.0	15.0	13.0	16.0	16.0	19.0	15.0	13.0
26.0	29.0	33.0	26.0	29.0	29.0	25.0	25.0	21.0	31.0	24.0	25.0
15.0	22.0	24.0	19.0	12.5	19.0	15.0	19.0	19.0	22.0	17.0	15.0
34	27	34	32	30	30	18	29	29	30	29	32
34	27	26	29	28	28	—	—	25	28	—	27
Easterly.	S.S.E.	E.N.E.	N.E.	Northerly	Uncertain	Northerly W.	Northerly W.	N.W.	N.W.	N.E.	N.W.
0—1	0—1	1—6	3—6	1—4	1—2	1—2	1—5	2—6	3—5	3—6	1—6
Shiranuka Bay; cruised in the Kunajiri Channel.	Shut up by masses of ice in the Kunajiri Channel.	Exposed to danger from icebergs in the Kunajiri Channel.	From the Kunajiri Channel for Atsugashi Bay.	Atsugashi Bay.	Atsugashi Bay. Shiranuka Bay.	Shiranuka Bay.	Atsugashi Bay.	Shiranuka Bay. Departed for the Yotorofu Channel.	From the Yotorofu Channel for the Shiranuka Bay.	Shiranuka Bay.	Shiranuka Bay.

WEATHER

(The table showing the mean readings in the

Year & Month.		February (from 6 of the Month) 1904.	March.	April.	May.
Locality.		Chang-kiang, Tama- noura, Sasebo, Na- gasaki, Chin-hai Bay, Chuk-nim-pho, Fu- san.	Chuk-nim-pho, Ta- keshiki. The south- western Coast of Ko- rea. Tai-dong-gang.	Tai-dong-gang, I- hoa-pho, The Yalu River.	The Yalu River, Yen-ta-ao, Gulf of Pe- chili, Tsin-tai-tze Li-chang-shan-tieh- tao.
Air Pressure. (Inch.)	Max.	30.42	30.42	30.43	30.25
	Min.	29.74	29.75	29.54	30.73
	Mean.	30.20	30.17	30.07	29.99
Air Temperature (°F.)	Max.	61	58	64	66
	Min.	35	27	40	48
	Mean.	48.2	42.5	51.5	56.9
Difference between Dry and Wet Bulb Thermometers. (°F.)	Max.	8	8	8	10
	Min.	1	0	0	0
	Mean.	3.7	2.9	3.1	3.2
Remarks.			Abundant icebergs at the Tai-dong River in the middle of the month ; a heavy storm on the 8th, while at the south-western Coast of Korea.	On 8th, a storm.	

CHART.—*Uji.*

chart room hourly at sea, per 4 hours at anchor.)

June.	July.	August.	September.	October.	November.	December.
Gulf of Pechili. Li-chang-shan-lih-tao.	Li-chang-shan-lih-tao. Gulf of Pechili.	Ying-kow.	Ying-kow.	Ying-kow.	Ying-kow.	Talien Bay and the neighbouring sea.
30.01	30.05	30.15	30.21	30.59	30.72	30.77
29.58	29.56	29.56	29.78	29.86	29.84	29.82
29.91	29.85	29.85	30.00	30.24	30.27	30.40
73	83	87.5	87	74	59	56
57	66	64	45	36	14	15
65.4	73.1	76.7	69.0	51.5	39.5	34.1
10	10	10	19	11	8	6
0	0.5	0	1	1	1	0
3.1	2.5	3.6	5.4	4.4	3.0	2.1
Foggy toward the end of the month.		Sultry at the beginning of the month, sleep impossible below on the lower deck.	From the middle of the month the temperature descends suddenly.	.	From the middle of the month, descended often below freezing point, bitter cold felt.	Stormy weather once at the beginning, once again in the middle of the month.

WEATHER CHART—THE CONVERTED CORUISER *Nippon Maru*.

(Dec. 13, 1904—

Months & Days.	13(Dec., 1904)	14	15	16	17	18	19	20
Weather.	Rainy.	Cloudy	Cloudy	Cloudy	Cloudy	Clear and cloudy.	Clear and cloudy.	Rainy.
Air Pressure. (Inch.)	30.15	30.08	30.20	30.20	30.17	30.06	29.98	29.88
Air Temperature. (°F.)	54	59	65	64	74	78	87	82
Dry Bulb Thermometer. (°F.)	54	59	65	69	74	78	87	82
Wet Bulb Thermometer. (°F.)	52	55	61	65	71	73	80	80
Temperature in Boiler Room. (°F.)	72	83	90	93	87	98	100	105
Locality at Noon.	Sascho, 126° 29' E. Long. N. Lat.	60'' 00'' 07' 43'	30'' 30'' 10' 15'	60'' 60'' 16' 07'	60'' 60'' 22' 12'	60'' 60'' 49' 51'	60'' 60'' 27' 42'	60'' 60'' 12' 54'

WHILE CRUISING TOWARD THE SOUTH (OCEANIA).

Jan. 18, 1905.)

21	22	23	24	25	26	27	28	29	30	31	1 (Jan., 1905).
Rainy.	Clear.	Clear and cloudy.	Clear.	Clear.	Clear and cloudy.	Rainy.	Clear.	Clear.	Clear.	Clear.	Clear and cloudy.
29.90	29.85	29.85	29.89	29.97	29.97	29.86	29.84	29.96	29.98	29.97	29.99
77	82	82	83	84	86	85	85	84	82	82	82
77	82	82	83	84	86	82	85	84	82	82	82
75	77	77	79	79	80	80	79	80	79	79	80
93	108	108	108	108	116	110	120	109	100	100	102
E. Long. N. Lat.	Singapore Strait.		E. Long. N. Lat.	E. Long. N. Lat.	Sumatra. Telok Betong Bay.		E. Long. N. Lat.	E. Long. N. Lat.	E. Long. N. Lat.	E. Long. N. Lat.	E. Long. N. Lat.
106.° 45' 18"	107° 05' 00"	107° 05' 00"	109° 08' 15"	105° 50' 45"	107° 05' 00"	108° 15' 30"	105° 37' 50"	107° 19' 30"	108° 17' 00"	109° 46' 30"	
5.° 08' 30"	0° 34' 00"	0° 34' 00"	3° 44' 36"	5° 51' 45"	7° 58' 00"	7° 57' 50"	6° 16' 30"	3° 03' 30"	0° 31' 00"	2° 21' 30"	

WEATHER CHART—THE CONVERTED CRUISER *Nippon Maru*.

(Dec. 13, 1904,—

Months & Days.	2	3	4	5	6	7	8	9
Weather.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear and Cloudy.
Air Pressure. (Inch.)	30.01	30.02	30.07	30.05	30.04	30.06	30.06	30.00
Air Temperature. (°F.)	84	82	83	80	78	81	74	74
Dry Bulb Thermometer. (°F.)	84	82	83	80	79	81	80	80
Wet Bulb Thermometer. (°F.)	79	79	81	78	77	76	77	76
Temperature in Boiler Room. (°F.)	106	108	110	107	105	103	97	104
Locality at Noon.	E. Long. 113° 17' 30'' N. Lat. 3° 58' 00''	E. Long. 114° 39' 00'' N. Lat. 5° 20' 45''	Labuan Island.		E. Long. 110° 50' 30'' N. Lat. 4° 44' 00''	E. Long. 106° 38' 00'' N. Lat. 6° 28' 29''	E. Long. 103° 54' 00'' N. Lat. 10° 05' 40''	E. Long. 105° 43' 00'' N. Lat. 8° 13' 00''
	E. Long. 109° 34' 00'' N. Lat. 9° 25' 00''							

WHILE CRUISING TOWARD THE SOUTH (OCEANIA).

—Jan. 1, 1905.)

10	11	12	13	14	15	16	17	18
Clear.	Clear.	Clear.	Clear and cloudy.	Cloudy.	Cloudy.	Clear and cloudy.	Clear and cloudy.	Clear and cloudy.
29.98	30.00	30.06	30.10	30.11	30.14	30.19	30.19	29.82
73	73	72	73	65	60	59	57	59
80	80	79	73	70	63	61	60	62
75	76	75	70	67	62	57	55	61
92	98	106	90	88	88	80	77	86
E. Long. N. Lat.	E. Long. N. Lat.	E. Long. N. Lat.	E. Long. N. Lat.	Pescadore Island.		E. Long. N. Lat.	E. Long. N. Lat.	Sasebo.
113° 28' 30"	11° 33' 00"	117° 23' 30"	119° 31' 00"			121° 47' 30"	124° 47' 00"	
11° 33' 00"	14° 02' 00"	14° 10' 00"	21° 17' 00"			25° 51' 40"	28° 43' 00"	
			21° 14' 00"				48° 31' 00"	

WEATHER CHART.—*Chitose*, WHILE CRUISING

Year & Month.		21(Feb. 1905.)	22	23	24	25	26	27	28
Weather.		Cloudy.	Cloudy.	Clear.	Cloudy.	Cloudy.	Rainy.	Cloudy.	Cloudy.
Wind.	Most Prevalent Direction of.	E.N.E.— N.	N.N.E.	Light air	N.N.E.	E.N.E.	E.N.E.— E.	W.N.	N.W.— N.
	Strength of.	1—3	1—3	—	1	1	2—3	1—6	5—6
Air Pressure at Noon. (Inch.)		30.17	30.11	30.11	30.22	30.13	29.93	30.02	30.29
Humidity at Noon. (%)		58	50	52	63	58	53	50	47
Air Temperature. (°F.)	Max.	64	58	63	66	59	57	53	48
	Min.	48	46	43	51	52	53	47	45
The Dry Bulb Thermometer at Noon. (°F.)		58	50	52	63	58	53	50	47
The Wet Bulb Thermometer at Noon. (°F.)		52	45	48	54	50	47	46	43
Remarks.		Ozaki Bay.—Suscho.	Suscho.	Suscho.	Suscho.	Suscho.	Suscho.	Left Suscho, for the south.	

WEATHER CHART.—*Chitose*, WHILE CRUISING

(Feb. 27—

Year & Month.		13	14	15	16	17	18	19	20
Weather.		Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.
Wind.	Most Prevalent Direction of.	S.E.—E.	E.	E.	E.	N.E.—N.N.E.	N.N.E.—N.E.	N.N.W.	N.N.E.—N.E.
	Strength of.	1—2	0—2	1—2	2	2	2—3	1—3	1—2
Air Pressure at Noon. (Inch.)		30.07	30.07	29.97	30.03	30.01	30.04	29.97	30.04
Humidity at Noon. (%)		83	83	85	84	83	82	87	80
Air Temperature (°F.)	Max.	84	83	86	85	83	83	87	85
	Min.	80	81	80	80	80.5	80	80	78
The Dry Bulb Thermometer at Noon. (°F.)		83	83	85	84	83	82	87	80
The Wet Bulb Thermometer at Noon. (°F.)		77	78	79	80	80	80	85	75
Remarks.			Near Pulo Tioman.	Anchored at and set out from Singapore.		Entered the Api Channel.	Anchored at Victoria Port.	Set out for Brunei this afternoon.	Cruising along the north-western Coast of Borneo for the north.

WEATHER CHART.—THE CONVERTED CRUISER *Tainan Maru* WHILE CRUI-

Locality.		6 (Aug., 1905.)	7	8	9	10	11	12
		Departed at 1, p.m., Kori- sakoff for northern Sak- halin.	The eastern Coast of Sakhalin.	The eastern Coast of Sakhalin.	The eastern Coast of Sakhalin.	The northern Coast of Sakhalin.	Kuegda Point.	
Weather.		Clear.	Cloudy.	Cloudy.	Cloudy.	Cloudy.	Cloudy.	Clear.
Air Pressure at Noon. (Inch.)		29.66	29.63	29.68	29.75	29.85	29.99	29.96
Air Temperature (°F.)	4 a. m.	59	61	50	55	54	51	55
	8 a. m.	60	60	52	55	50	54	55
	Noon	64	57	56	54	55	55	58
	4 p. m.	64	56	57	54	53	57	57
	8 p. m.	62	52	54	53.4	50	55	55
	Midnight.	60	50	54	54	50	50	54
Difference between Dry and Wet Bulb Thermometer at Noon. (°F.)		2	5	2	1	1	1	1
Wind.	Most Prevalent Direction of	Unceer- tain.	S.S.E.	S.E.	S.S.E.	N.W.	N.E.	N.N.W.
	Strength of	1	2	2-3	2	2	2	3

SING TOWARDS THE NORTH EASTERN COAST OF SAKHALIN.—6-24 AUG. 1905.

13	14	15	16	17	18	19	20	21	22	23	24
Kol.	Kol. Ainu.	Port Ainu and Okhotsk Sea.	Sea of Okhotsk.	Okhotsk Harbour.	Okhotsk Harbour. Set out for the northern part of the same Gulf.	C. Elizabeth.	Sea of Okhotsk.	The north-eastern Coast of Sakhalin.	Robbau Island.	Talaika Bay, Tichmenev.	Korsakoff.
Cloudy.	Clear.	Cloudy.	Cloudy.	Cloudy.	Cloudy.	Clear.	Clear.	Cloudy.	Cloudy.	Clear.	Clear.
29.87	29.91	30.01	30.04	29.94	30.01	30.03	30.09	30.11	30.04	30.16	30.12
54	51	60	53	55	53	56	56	55	55	48	56
54	52	65	54	55	55	54	60	55	57	54	59
58	57.5	57	63	56	55	55	66	55	54	54	53
56	64	56	58	57	55	57	57	54	50	57	63
53.5	64	55	54	53	54	68	55	52	49	55	60
52	61	52	53	53	55	57	55	53	48	54	56
2	1.5	2	2	2	1	1	6	2.5	2	0	4
S.E.	S.W.	E.	Uncertain.	S.W.	S.E.	S.	S.E.	S.S.E.	N.E.	E.N.E.	S.E.
1	2	1-2	0-1	1	1-2	4	3	3-1	3	3	2

WEATHER CHART.—THE *Suma*, WHILE SCOUTING

(Aug., 7—25.

Days.		7	8	9	10	11	12	13	14
Weather at Noon.		Clear.	Clear.	Clear.	Clear.	Rain.	Rain.	Coudy.	Clear.
Air Pressure at Noon. (Inch.)		29.62	29.65	29.85	29.98	29.76	29.67	29.70	29.07
Humidity at Noon. (°F.)		68	63	55	55	54	53	57	59
Air Temperature. (°F.)	6, a. m.	64	59	60	49	50	49	50	56
	Noon.	69	60	48	50	50	48	56	63
	6, p. m.	61	58	49	50	50	48	54	53
Strength of the Wind.		Light breeze.	Gentle breeze.	Light breeze.	Light breeze.	Fresh breeze.	Fresh breeze.	Light breeze.	Fresh breeze.
Locality at Noon.		Left Korsakoff; cruising toward Shimushu-Island.	On voyage.	On voyage.	Shimushu-Island.	Shimushu-Island.	Left Shimushu-Island; cruising toward Avatcha.	Petropavlovsk.	Petropavlovsk.
Remarks.		Left Korsakoff; at 6, a. m.; scouting the Peninsula of Kamchatka.			Arrived Shimushu-Island, at 10, a.m.		Left Shimushu-Island, at 9, a. m. for Petropavlovsk.	Arrived at Petepavlovsk at 10,a.m.	Left Petropavlovsk, for Nikolavsk at 2, p. m.

ALONG THE SOUTHERN COAST OF KAMCHATKA.

1905.)

15	16	17	18	19	20	21	22	23	24	25
Cloudy.	Clear.	Fog.	Clear.	Clear.	Clear.	Clear.	Clear.	Fog.	Clear.	Clear.
29.88	29.99	29.90	30.19	30.08	30.22	30.22	30.12	30.14	30.14	30.16
54	52	52	59	54	58	59	53	55	55	60
49	51	50	51	49	51	50	50	48	53	59
50	51	56	54	50	59	53	54	49.5	57	66
49	49	52	48	50	50	50	50	51	56	64
Moderate gale.	Gentle breeze.	Calm.	Calm.	Light breeze.	Gentle breeze.	Gentle breeze.	Gentle breeze.	Gentle breeze.	Gentle breeze.	Gentle breeze.
Cruising toward Nikolaevsk from Petrovavlovsk.	Nikolaevsk.	Nikolaevsk.	Cruising toward Petropavlovsk from Nikolaevsk.	Cruising toward Petropavlovsk from Nikolaevsk.	Petrovavlovsk.	Shimushu-Island.	Shimushu-Island.	For Korsakoff.	For Korsakoff.	Korsakoff.
Arrived Nikolaevsk, at 9, a.m.	Left Nikolaevsk for Petrovavlovsk at 2, p.m.		Arrived Petrovavlovsk, at 5.40, p.m.	Left Petrovavlovsk for Shimushu Island.	Arrived Shimushu-Island.	Left the Island for Korsakoff.				Arrived Korsakoff, at 8.53, a. m.

CHAPTER III.

INSPECTORS OF MEDICAL AFFAIRS OF SQUADRONS.

Previous to the war of 1894-5, the flag-ship of our standing squadron had, as a rule, a staff surgeon who attended the management of the medical as well as sanitary affairs of the squadron; but a new arrangement was then made,—that such squadron should have a chief medical officer who should be a surgeon inspector of the Navy, and that the flag-ship should have for its chief medical officer a staff surgeon. When the Standing and Western Squadrons were combined into a united fleet, the Western Squadron had a staff surgeon as its chief medical officer, and from that time onward it was customary for our Standing Squadron to have on the staff of the Commander-in-Chief a chief medical officer specially appointed. In consequence of the changes in the Regulations relating to our Fleets and Squadrons in 1903, this office came to be abolished, and there was left only a Clause 3 in Art. XVI of the Regulations to the effect that an inspector of medical affairs of a squadron may be appointed in a case of need. When, however, the complications between Russia and Japan became acute, the necessity of having an inspector for the squadrons was recognized. Surgeon Inspector S. Suzuki was then appointed as the inspector of medical affairs of the First Squadron of the Combined Fleet, to be carried on the flag-ship *Mikasa*, to participate in the council of the fleet and to manage the medical and sanitary business of the ships under that commander. He was afterwards appointed to an additional charge as inspector of the Second and Third Squadrons.

The Second Squadron, however, being detached from the main force, acted for a long time in a quarter far removed from the rest of the ships. Inconveniences arose in the management of the medical business and Staff Surgeon K. Mochidzuki, chief of the medical staff of the flag-ship *Idzumo*, was made to participate temporarily in the council for the squadron.

In the second period of the naval war, the flag-ship *Idzumo* of the Second Squadron had Surgeon Inspector Y. Saito, and the flag-ship *Itsukushima* of the Third Squadron Fleet Surgeon T. Nankao as inspectors for the management of medical and sanitary business; while the Surgeon-General Suzuki attached to the First Squadron took part, in fact, in the council for the Combined Fleet and controlled the whole of the medical and sanitary affairs of the Fleet.

At the beginning of the third period our Combined Fleet was organized in four squadrons, to each of which was attached an inspector. By this change Surgeon-General Suzuki was made the inspector of medical affairs of the First Squadron and of the Combined Fleet; Surgeon Inspector Saito was that of the Second; Fleet Surgeon Nakao, of the Third; and Fleet Surgeon K. Asai was chief medical officer both of the *Iki* and of the Fourth Squadron.

On June 24, 1905, when Surgeon-General Suzuki was transferred to the Imperial Headquarters, he was succeeded by Surgeon-General K. Yamamoto as the inspector of medical affairs of the First Squadron, while attending to the business of the Combined Fleet. This arrangement continued until the conclusion of the war. With the dissolution of the Combined Fleet, the office of the inspector of medical affairs of the squadrons came to an end.

The following shows the changes in the personnel of the medical inspectors of our squadrons during the war of 1904-5 :—

S. Suzuki, Surgeon Inspector released from duty as Director of Maidzuru Naval Hospital and from an additional duty as chief medical officer of Maidzuru Naval Station, and appointed the inspector of medical affairs of the First Squadron on..... Jan. 19, 1904.

Appointed in addition the medical inspector of the Second Squadron on Feb. 6, 1904.

Appointed in addition the medical inspector of the Third Squadron on March 17, 1904.

Released from duty as the medical inspector of the Second Squadron on..... Sept. 1, 1904.

Promoted to Surgeon-General on..... Jan. 12, 1905.

Appointed the medical inspector of the First Squadron on. Jan. 12, 1905.
 Appointed the medical inspector of the Combined Fleet on. June 16, 1905.
 Released from duty as inspector of medical affairs of the
 Combined Fleet on June 24, 1905.

Released from his present duty and appointed a member
 of the Imperial Headquarters on..... June 24, 1905.

K. Yamamoto, Surgeon-General released from duty as
 Director of Yokosuka Naval Hospital and from his additional
 duty as chief medical officer of Yokosuka Naval
 Station, and appointed the medical inspector of the First
 Squadron on..... June 24, 1905.

Appointed to medical inspector of the Combined Fleet on June 24, 1905.

Y. Saito, Surgeon Inspector released from duty as
 member of Medical Department of the Imperial Headquarters
 on Jan. 23, 1905

Appointed chief medical officer of *Idzumo* on..... Jan. 23, 1905.

Appointed in addition medical inspector of the Second
 Squadron on..... June 21, 1905.

T. Nakao, Fleet Surgeon released from duty as chief
 medical officer of Takeshiki Secondary Naval Station, and
 appointed chief medical officer of *Itsukushima* on..... Feb. 5, 1905.

Released from duty as chief medical officer of *Itsukushima*,
 and appointed chief medical officer of *Yakumo* and
 in addition medical inspector of the Third Squadron on. June 21, 1905.

K. Asai, Fleet Surgeon released from duty as chief
 medical officer of Naval Barracks at Sasebo and appointed
 chief medical officer of *Iki* on..... June 14, 1905.

Appointed in addition medical inspector of the Fourth
 Squadron on..... June 21, 1905.

Released from duty as chief medical officer of *Iki*,
 and from the additional duty as medical inspector of the
 Fourth Squadron, and appointed chief medical officer of
Itsukushima and in addition medical inspector of the
 Fourth Squadron on Aug. 23, 1905.

CHAPTER IV.

GENERAL STATE OF SANITATION OF OUR FLEET ON ACTIVE SERVICE.

SECTION I. SANITARY INSTITUTIONS.

It would seem to follow that inasmuch as our medical and sanitary regulations in war times are the same as in ordinary times, the management of our business should have been carried out in accordance with the provisions made in the General Instructions for Medical Officers. But the question of sanitation for our men on active service was one of so imperative a nature, that efforts were constantly being made in the hope that nothing might be omitted that should seem desirable for the health preservation of our fighting force.

Meetings of the chief medical officer of the Combined Fleet and chief medical officers of ships and vessels, were held from time to time at the Sasebo Naval Hospital to confer on urgent questions as they arose, such as the prevention of infectious diseases, precautions against frost-bite, appliances for heating rooms, etc.,—inoculations were enforced, and lectures given from time to time on the subject of hygiene, so that each individual might have his attention drawn to the preservation of his own health, etc., etc.

Diet, as being one of the most important factors for the maintenance of the health of the forces, received the most careful attention in our Navy. The necessities of the service were a heavy strain on the physical capacities of our men, and Surgeon Inspector Sudzuki of the United Squadron, having stated his views on the necessity of a consequent increase in the allowances of food, the Commander-in-Chief issued an order on March 2, 1904, to the fleet under his command, which ran as follows:—

“ Allowances for food in kind are increased by 20 per cent until further notice.

N. B. As 20 per cent is the maximum allowance for articles in the list (Table 1) below ‘parched barley’, any amount within that limit may be given

at discretion. The quantity of rice shall not exceed 100 *monme* for one man per day."

Surgeon Inspector Sudzuki further noticed that the food supplied for the greater part of men enlisted and hired on repair ships, hospital ships, and water supply vessels was not quite up to the standard of nutritive value as prescribed by the Regulations. He had already been warned of possible danger by actual instances during the war of 1894-5, when numerous cases of *kakke* occurred among enlisted and hired men, and determined to lose no time in expressing his desire that the food might be changed to the allowance-in-kind scale of dietary. As a result of his representations, on April 29 the Commander-in-Chief made the following telegraphic communication to the Minister of Marine:—

"As a considerable number of men of the Navy and workmen are being carried on repair ships, hospital ships and water supply vessels, their food according to the present boarding system has been found to be deficient in nutrition from a physiological point of view. Much anxiety is felt for their health during this hot season; and it is desired that their food shall at once be changed to an allowance in kind, as in the ships of the fleet."

The time being towards summer, the medical staff in charge of sanitation for the fleet and fleet auxiliaries paid special attention to preventive measures against infectious diseases, and took every precautions with regard to food, drink and clothing. But it happened towards the end of May that there occurred on board the *Yakumo* numerous cases of acute gastric and intestinal catarrh, amounting in all to seventy-seven, and from that time until the beginning of June cases of the same disease occurred in succession on the *Tainan Maru*, *Mikasa*, *Asama*, *Asahi*, *Shikishima* and *Nikko Maru*. It being suspected that the root of the mischief lay in the food supplied to the men, Surgeon Inspector Sudzuki summoned the chief medical officers of all the ships of the fleet to a conference on board the *Mikasa*, and spoke at length on the necessity of having closer attention paid to sanitation in general; after which the Commander-in-Chief issued the following instruction:—

"It is now four months since the commencement of the war and as the summer season is coming on, the strain of the constant work is beginning to tell

on the men, and a succession of cases of the acute gastric and intestinal catarrh has been reported. It appears that men on night duty, who are obliged to forego their proper sleep, make up for the loss by snatching sleep during the day whenever they have leisure. The consequence is that they lose their proper amount of bodily exercise, and that injury to health ensues.

“In view, however, of the fact that our naval operations may yet extend over a long period of time, it behoves the men of our fleet at all times to strive to strengthen their mental and bodily vigour so that they may always be ready for the call to conflict. The captains of our ships and vessels are hereby urged to take especial care with regard the quality of the food supplied to the men, and at the same time must enforce a regular drill (for at least one hour) every day, whether the ship be at sea or at anchor. This should be done in order to promote bodily activity of men, and at the same time to stimulate and brace up their spirits. It is also necessary that on all ships or vessels which are specially active in service and often put to sea, particular care should be given to the health of the men in the engineer branches.”

On the same day a notice was put up stating that the canned salmon supplied had been over three years in the tins, and had consequently passed the date guaranteed by the merchants, so that it would in most cases be found rotten and decomposed. The strictest inspection should therefore be made.

It was just about this time that our Combined Squadron having driven the enemy's fleet into Port Arthur, was investing the Liao-tung Peninsula. Dahn had been occupied and various defensive work were in course of construction. Work of all kinds was as brisk as it could be. The hot season was just setting in, and the difference of temperature between day and night was exceedingly great, the humidity of the air having greatly increased. It was indeed a very critical moment for the health of our men; but fortunately nothing serious happened excepting that from the middle of June to the middle of July some cases of diarrhoea mostly slight ones, occurred on some of the ships. Cases of typhoid fever, dysentery, etc., were only sporadic and showed no signs of becoming seriously prevalent. Preventive measures, however, could not be slackened; it was decided as a preliminary measure to prohibit canteen merchants and others

from coming on board victualling ships and water supply vessels. On July 10, Commander N. Matsumura, captain of *Taichu Maru*, was appointed chairman of the quarantine commission, and Surgeon S. Hirano, chief of the medical staff of the ship, with six others, was appointed to act on the commission. This body was to attend to the medical inspection of transport ships coming from home and to take preventive measures against infectious diseases on all our ships and vessels at the fleet rendezvous.

On August 1 an order was issued permitting the crews of destroyers to have rice and cracked barley as substitutes for biscuits for the time being, provided the amount per meal were the same as the quantity then allowed for rice and cracked barley. This was done because fresh bread was unobtainable, owing to the nature of the service for which destroyers were intended and used.

On August 7 an amendment was made on the proviso to Order No. 32 of the Combined Squadron, published some days before. It ran as follows:—

“Such articles of food as require a 20 per cent increase may be given at discretion, provided that 20 per cent remain the maximum, otherwise there should be no addition at all. As for rice, the actual amount for one man per day shall not exceed 100 *monme*.”

In August and September a few sporadic cases of dysentery and abdominal typhus occurred on some ships of the fleet, with a tendency to spread. The sources of contagion seemed to lie partly in the newly occupied (region of) Dalny and partly on the transport vessels coming from home. The Commander-in-Chief then gave a warning to the fleet under his command by means of a notification on September 19, followed by an instruction on the 26th. At the same time he sent a telegram to the commander of the Sasebo Naval Station, Admiral K. Sameshimma, expressing his desire that strict attention should be paid to transport vessels running between that port and the fleet. He also sent a communication to the Special Service Corps at Dalny asking that some measure be devised as a precaution against the diseases. And further Surgeon Inspector Suzuki communicated to the chief medical officers of torpedo depôt ships to caution them against the diseases on torpedo boats, destroyers, etc.

Below are the Notification, and Instruction issued by the Commander-in-Chief Togo :—

Notification.—“ Cases of dysentery and abdominal typhus have occurred in Siao-pin-tao and Dalny ; and our men are strictly prohibited from landing there.

“ Fresh bread coming from Dalny shall be well steamed before it is served at table.

“ Vegetables and fruits brought from Dalny require special care.”

Instruction.—“ It is now eight months since our Combined Squadron started on active service. During all this time, in spite of many changes of temperature, and in the midst of the severest trials and hardships, our men have enjoyed the best of health and vigour. For this we are thankful. Now, however, the intense heat has gone, and the cool season has set in. It is with no small regret that we now hear of the occurrence here and there of sporadic cases of dysentery and abdominal typhus. The sources of the diseases seem to lie principally in Dalny and Siao-ping-tao. Ships and vessels in intercourse with those districts should observe the utmost caution respecting food and drinking water for table use, the two most important factors in resisting these terrible diseases. And nothing should be encouraged that in any way promotes the wasting of bodily vigour by the men, for this is the very source of the fighting strength of our fleet.”

As to the allowance made to the Naval Heavy Gun Brigade attached to the 3rd Army, the authorities were informed of the necessity of raising the standard up to that provided for by the Naval Regulations ; and for this the necessary sanction was ultimately obtained. On October 10 Surgeon-General Baron Sameyoshi, Chief of the Medical Department at the Imperial Headquarters, with Surgeon Inspector Saito, member of the department, paid a visit to the flag-ship *Mikasa* on his tour of inspection of sanitary conditions at the front ; and having collected on board the flag-ship the chief medical officers of the ships lying near Yüen-tao gave an instruction on sanitation.

On the same day, the Commander-in-Chief of the Combined Squadron, alarmed lest the transport ships might be infected through the persons who took

passage on them, issued an order to the officers in command of ships and naval corps at the front to take proper precautions against this danger. We reproduce the substance of the order.

“ 1. No person will hereafter be granted a passage home on a transport, unless he is provided with a permit to the effect that he has undergone a proper examination by medical officers and has been declared perfectly healthy.

“ 2. Permits shall be refused except for such ships as carry medical officers, unless it be otherwise determined as being necessary.”

The following notification was published on October 28 :—

“ Whereas cases of dysentery and abdominal typhus have occurred on ships of the fleet and seeing that, despite all precautions, the diseases show no signs of abating, great caution must be observed on various points to be enumerated. For instance, at the time of coaling from colliers laid alongside of our warships and when multitudes of our men are at work in the transport vessels, care should be taken that medical officers from our ships be dispatched to control the conduct of the men so that nothing be done injurious to health. This point, it seems, has not hitherto been sufficiently enforced, and a closer attention to it is hereby invited. The comparatively larger number of cases among men of the engineer branch give us reason to suspect that the thread-waste used in the engine-room to be one of the causes of infection.”

With the fall of Port Arthur at the beginning of January, 1905, came the destruction of the enemy's First Pacific Squadron, but their Second and Third Squadrons which had left Russia sometime before were still on their eastward voyage. The greater part of our Combined Fleet, therefore taking advantage of the partial conclusion of hostilities as far as Port Arthur was concerned, was sent home for repairs, and to give the crews a much needed rest. The Commander-in-Chief and commanders under him cautioned their men, as did also the officers of the medical staff by frequent lectures, to pay strict attention to the importance of preserving their health, and special emphasis was laid on the precautions against infectious and especially against venereal diseases.

Surgeon Inspector Sudzuki, the chief medical officer of the Combined Squadron, on

the return of his ship the *Mikasa* to the Port of Sasebo, towards the end of December, 1904, proceeded to the capital and held conferences with the authorities concerned on various matters relating to the medical and sanitary future of the Combined Squadron; and it was decided, as already stated under the heading "Medical Officers attached to the Fleet", that each squadron should have a medical officer attached to it to ensure speedy dispatch of medical affairs.

It frequently happened during the present service that officers and men suffered from diseases of the teeth, and the ordinary medical staff being unable to cope with this troubles, a report to this effect had already been made by the Commander-in-Chief during the first period of the war. In consequence of this report Staff Surgeon Harada had been attached to the fleet with the special function assigned to him of attending to dentistry cases. This proving an insufficient provision, it was further arranged at the beginning of the second period that Staff Surgeon Harada should be attached to the First Squadron only and that for the other squadrons a civilian dental surgeon should be employed. At the same time instruments, drugs and consumable articles requisite for dental practice were supplied as extra medical stores to each flag-ship. In the third period, two additional civilian dentists were engaged as attachés to the Squadron. These dentists went from one ship to another and attended to their practice in obedience to the Rules of Medical Consultation prescribed for each ship.

On February 5, 1905, when a larger part of the Second Squadron received an order to leave Chin-hai Bay for Port Lazaref to convoy the army transport *Ryusei Maru*, Surgeon Inspector Saito summoned the chief medical officers of all the ships to be dispatched for a conference on the flag-ship *Idzumo*. The result of this conference was immediately printed and distributed among all the ships of the squadron. By this new arrangement, all the ships ordered out were to signal every day at noon about the number of the sick off duty; and cases of contagious and other serious diseases were to be reported immediately on occurrence.

"I. Prevention of Frost-bite and Cold.—That the following items should be added to the modes of prevention as given on page 441, Part III of 'the Naval Sanitary History of Chino-Japanese War.'

“ 1. That gloves and socks shall always be kept clean-soiled or wet ones shall never be worn.

“ 2. That hands and feet—especially between the fingers and toes—shall be kept clean by periodical wiping. Experience has taught us that wrapping up one's foot in a piece of *hanshi* (Japanese tissue paper) and putting a sock over it is a good means to keep one's feet warm and to prevent frost-bite. This might well be tried.

“ 3. That on rising from bed in the morning and before going to sleep, the hands and feet shall be well rubbed and then smeared with grease (grease mixed with a little camphor is good).

“ 4. That wounds on the hand and foot, however slight, should at once be put under treatment, as otherwise the cold may get into them and frost-bite ensue.

“ 5. That the auricula, being particularly deficient in blood circulation in cold weather, are apt to suffer from frost-bite, so that they should be rubbed with grease from time to time.”

For Reference. The prophylaxis given in “Naval Sanitary History of Chino-Japanese War.”

‘ 1. Wipe and keep your hands and feet dry after having wetted them in cleaning the deck.

‘ 2. When you are on watch or sentry duty in cold weather and your nose, ears, hands and feet are about to grow benumbed and senseless, rub them hard with your hand. Such parts feel pricking pain from cold at first and then grow numb: at such times gangrene is apt to set in; so that you must rub them well while you feel the pain.

‘ 3. Do not warm your benumbed hands or feet too hurriedly by bringing them into warm or hot water, or putting them near the fire. Rub them well first and after having restored some warmth in them, you may then warm them at the fire.

‘ 4. When a stoker or a cook or others who work near a fire feel hot and perspire all over, they must take care not to appear suddenly on the upper deck or to come in contact with the cold air without wiping off the sweat.

‘ 5. When the cold wind is strong, keep your mouth firmly closed and try to breathe through your nose as much as possible.

‘ 6. You must not of course get intoxicated while on board your ship. Some men get drunk on only a single eup of spirit, after which they feel hot all over for a while. Such men must not reduce the amount of clothing. It is very bad, when drunk, to lie down to sleep without remembering to keep oneself warm.

‘ 7. Don't reduce your clothing even after your bath.

‘ 8. When the order is given for “all hands on deck”, you must not come out on the upper deck without having your regular amount of clothing.

‘ 9. When you are in cold air, take as much exercise as your rules of duty permit.’

“ II. Stations or Posts for the Carriers of the Wounded.—In the present war, we have had a comparatively large number of casualties among men of this class. Henceforth we must try to protect them by providing them with places of safety in which they may lie concealed, until their services are required for the conveyance of the dead and wounded.

“ III. The statistics up to date for the present war show a comparatively large number of cases of injuries to the ear. It seems that most of them are due to not having ear-plugs. We must take care to make not only the guns' crews, but all men posted near a gun, use ear-plugs (made of cotton floss).

“ IV. Our experiences so far make us conclude that those who have died from (compound) fractures have done so not so much from shock as from haemorrhage. We must, therefore, make the carriers of the wounded carry with them rubber tubes for tourniquets that they may at once apply them to the wounded limbs whenever necessary.”

This division of the squadron afterwards made frequent movements in the direction of North Korea; and each time the above cautions were strictly enforced. For men dispatched on land independently of the squadron, and for those on transport ships carrying no medical officers, proper measures were taken, to ensue that no effort should be spared that might seem desirable for the preservation of health on our ships.

At this time the main forces of our Combined Fleet were collected near Chin-hai Bay, and the contagious diseases prevalent in Korea being of serious concern for our ships, on February 17 the Commander-in-Chief issued strict injunctions relative to the scarlatina then prevalent about Seoul and the smallpox that was diffused all over Korea. His proclamation went so far as to enjoin that even the servant-boys newly hired for ships and places under his command should immediately be vaccinated.

Our fleet was at this time busy with preparations for hostile movements, and the training and discipline of the medical staff was a matter of as much importance as the strategic drill. Surgeon-General Sudzuki of the Combined Fleet, therefore opened communications with the captain of each ship requesting an immediate execution of his proposals, that the medical officers of the ships

lying near the base should be made to for the time being prosecute practical studies by visiting the hospital ships in turns, so far as the visits did not interfere with their proper duties. The enemy's squadron was now approaching and the time for decisive action was fast drawing nigh. Not a single day now passed in idleness: the whole of our Combined Fleet was busily engaged in scouting and watching the straits, in drilling manoeuvres, and every effort was being made to inspire the men with resolution and courage. Not a stone was left unturned that might avail for the perfecting of our fighting forces. The temperature also was growing warmer and moister, and utmost care was necessary to ensue proper sanitation. The members of our medical staff, therefore, made special efforts to prevent epidemic diseases and to preserve the general health of our men. Steps were constantly taken to inquire into the local sanitation of the district near our naval base and for taking measures proper for the occasion, and nothing was omitted that might be calculated to secure the comfort of the sick and wounded. For instance, whenever a few cases of infectious disease were reported on land as well as on the ships near Chin-hai, an order for the day would be issued prohibiting intercourse with the infected locality, and warning against the risk of infection from the unclean Korean boats which were plying about. And in the quarters near Takeshiki we induced the local governor to enforce the inspection of food and drink in the neighbouring towns and villages, to order preventive measures against infection, bacteriological examination, etc., to exercise strict control over men on shore, provisions for ships, etc., and entirely to cut off the communication with the land whenever necessary. In this way we endeavoured to shut the door against the intrusion of virus.

Towards the end of April, the Director of the Medical Bureau informed the chief medical officers of the ships at the front that, in addition to the carbolic acid hitherto supplied, "desinfectol" might be used every day as a disinfectant and deodoriser for water closets, etc.; and in the middle of May, he issued a notification that a high pressure spray apparatus should be provided for disinfecting purposes, and all the ships were soon afterwards supplied with this instrument which proved of much practical benefit.

The enemy's squadron having been annihilated in the encounter in the

Japan Sea on the 27-8th of May, and no more fear on the seas remaining, our Combined Fleet was reorganized into four squadrons, the First and Second Squadrons remaining near the Korean Strait, and while constantly keeping guard and training, the ships returned home one by one for necessary repairs. On this occasion the Commander-in-Chief Admiral Togo cautioned his men to observe a strict care for the health, military discipline, and public morality.

The Third and Fourth Squadrons, started as Northern Squadrons for Ominato at the end of June, so as to co-operate with the 13th Independent Division of our Army in the occupation of Sakhalin. Surgeon-General Sudzuki of the Combined Squadron held a conference with the chief staff officer of the Third Squadron on matters relating to the preparations to be made on the part of the medical staff, in view of the fact that the Northern Squadron was now about to take action in the seas round Sakhalin. As a result of this conference, Fleet Surgeon Nakao attached to the Third Squadron was ordered to call a meeting on board the flag-ship *Yakumo* of the chief medical officers of all the ships of the Northern Squadron as soon as they had collected at Ominato. The following points were submitted for deliberation and adopted for execution :

1. That chemicals for testing water should be abundantly provided ;
2. That ammonia should be kept in store as a remedy to be applied to wounds made by bites and stings of venomous insects ;
3. That larger stretcher poles should be provided for use on land, as those for use on board were too short ;
4. That the medicine chests for landing parties should contain whatever dressing materials, quinin and other requisites might be necessary ;
5. That as the lighting apparatus attached to medicine chests for landing parties does not give sufficient light, lamps for use on ships should be kept in stock ; and
6. That the "Cautions against Cold" having been distributed in print to all the ships, proper attention should be paid to them, (Printed paper omitted here).

Our Northern Squadron commenced its movement at the beginning of July. The time was towards the hot season, and the Naval Minister Baron Yamamoto

published an instruction on July 4, to all under him concerning the sanitation of our fighting men at the front ; and at the same time Baron Saneyoshi, Chief of the Medical Department at the Imperial Headquarters, communicated, by order of the Naval Minister of State, an instruction relating to the prevention of epidemic diseases, as under :—

“ It is highly satisfactory to think that the sanitary condition of our Navy has been excellent since the opening of the war, as a consequence of the frequent instructions that have been given concerning the prevention of epidemic diseases, which is one of the most important questions in war time, and as the result of the intelligent and close attention paid to it by you, the officers in charge. It is, however, a fact well known from history that it is not an easy matter to maintain at a high level the original spirit and health of men after the lapse of a long period of struggle, and, therefore, care, ever more vigilant and attentive, is deemed necessary for the future. Rumours saying that cholera is prevalent in the Russian army appear frequently in the newspapers. The existence of contagious diseases, such as cholera, dysentery and smallpox in Korea and the Russian Maritime Province is well-known and its outbreak here daily expected. This point requires our utmost caution. The plague, open or lurking, in parts of our own country such as Tokyo, Osaka, Hiroshima, Kagawa, Bikan, etc., though fortunately not likely to have much immediate extension, still requires its proper share of attention. The fact that there are a good many cases of animal parasitic diseases among those who eat fish and vegetables on the coast of the northern seas, is another reason for watchfulness. Besides all this, the fog in the northern seas, the heat by day and the coolness by night are all considered to be injurious to health. We hereby order you by order of our Minister of State to give due attention to the fact that from now onward nothing should be omitted by way of enforcement of sanitation both private and public.”

Another step taken by our Northern Squadron, previous to its movement northward, was to provide cold-weather rigs for the men and to keep up a constant and minute care for precautions against frost-bite and cold. It so happened however that, while we were cruising in Sakhalin waters, though the air was much more foggier and more humid than our home air, and though the sea

was rarely as calm at sea as in our home waters, yet neither weather nor temperature was as bad as had been anticipated, and cold-weather rigs and such things were of little practical use excepting for those ships that cruised in the seas north of Sakhalin. Contagious diseases were also of rare occurrence, as close attention was paid to the sanitary conditions along the coast near by and in the localities touched at by our ships. Yet, notwithstanding the strictest precautions some cases of *kakke* occurred among coolies temporarily embarked on board the transport ships *Oakley* and *Silviana*. Hereupon Fleet Surgeon Nakao, attached to the Third Squadron, summoned the captains of all the transport ships to meet on board the flag-ship, and gave instructions about the disposition of the patients and the improvement to be made in diet according to the Naval Victualling Regulations. Many cases, also, occurred among workmen and coolies employed in building a temporary signal station. Medical officers were immediately dispatched for inquiry; and infected patients were at once sent home.

After the successful occupation of Sakhalin our Northern Squadron was set to guard the coast, the Combined Squadron commencing its homeward journey from the time when peace seemed to be on the point of restoration, i.e. from the middle of September till the beginning of October. Our present service has spread itself over a period of twenty months during which time our ships have scoured the seas from the torrid to the frigid zone, facing heat and cold, wind and rain, and all manner of hardships, before at length securing the victory. With the return of peace our men would go home as heroes to be fêted, and in the elation of the hour would expose themselves to dangers of the worst description. The officers in charge of the fleet sanitation had made frequent attempts to give hygienic lectures to the men, prior to the ships' departure from the naval base, and had at other times given explanations of the existing sanitary features of certain localities at home, so as to awaken each individual conscience to the consideration of his own health. They had also resorted to various other expedients for enforcing precautions against epidemic and venereal diseases. The consequence of all this activity was, that the sanitary condition of the fleet in action was on the whole extremely good—even better comparatively, than that of ordinary times.

SECTION. II. PROVISIONS.

In 1884 a great reform was made in the victualling of our Navy; and afterwards in 1890 the Naval Provision Regulations and Rules for Management were established, by which allowances in money were entirely abolished; and all allowances ordered to be made in kind. Some slight amendments were afterwards introduced from time to time, but the principle of the reform remained unchanged. In the present war, allowances were at first made according to the Regulations and Rules of 1898; but with the promulgation of the Ordinance relating to Naval Allowance with the Detailed Rules for its enforcement, in April, 1904, the above regulations and rules came to be entirely abolished; so that we were henceforth guided solely by the new ordinance. This new ordinance was much the same in substance as the old regulations, being no more than a simplification of the complicated wording and useless formalities to be found in the older document, with some slight reductions of salt and fat among the articles of provision. The articles in detail as far as they relate to the provisions allowed by the above ordinance and the executive rules are given in Chapter I, Book First. Speaking briefly, our naval allowances are given in kind as shown in the Tables XX. and XXI in the Rules for the Enforcement of the Ordinance to all men of our Navy excepting those above warrant officers and cadets, to whom allowances are made in cash as table-money. There are three courses prescribed, as shown by the Tables A, B and C. The course (A) is for ships at sea, (B) for ships at anchor and for shore establishments while (C) is for prisoners as also for persons coming under No. 9, Art LXXX, Ordinance for Allowances. The ships at sea, however, are not obliged strictly to follow (A), but may take (B) as far as is feasible. Seeing, however, that our men were exerting both their mind and body to the utmost, by working day and night in the prosecution of the war, Order No. 32 of the Combined Squadron relating to the increased allowance was issued on March 2, 1904; and the medical officers of all our ship, in co-operation with accountant officers, paid the utmost attention to the selection of materials for food, carefully examining every article of provision for the table.

It was made a rule, during the war, to provide as much fresh provisions as

possible, instead of preserved ones—victualling ships and transport vessels being made to carry fresh provisions from home on every trip. At first, however, this arrangement was necessarily incomplete and it was very hard to meet the demands from all the ships of the fleet, as every time the victualling vessels arrived, each ship in the fleet strove to get ahead of the rest in getting a supply of fresh food, and late-comers often failed to obtain anything like their share. Such being really the case, the Sasebo Naval Victualling and Clothing Dépôt, wishing to make a fairer distribution among all the ships, allotted distinct portions for each ship according to fixed scales. Then came another difficulty: the season was advancing, and fresh provisions were apt to get decomposed on the way. When, therefore, any of our ships at the front got a day or two behindhand in obtaining their supply, owing to their service and consequently their absence from the naval base, what they got was anything but fresh. Hence it was so arranged that cattle should be embarked alive on victualling vessels, and that they should be butchered out at the front. We now got supplies of fresh meat; but as for vegetables and bread we had much difficulty in keeping them fresh, now that our naval base was now so far advanced, and that the climate was so hot and the seas so foggy. The Sasebo Naval Victualling and Clothing Dépôt made various attempts to keep bread from going mouldy—thus the shapes of the loaves were changed so as to have all four sides baked brown,—a device that was partially successful, but was far from giving full satisfaction. At a later period, by permission from the Imperial Headquarters large numbers of fishing boats were brought close to our naval base, and the fish so caught were sold to our ships, much to everybody's convenience. In spite of all this, the supply of fresh provisions was still far from sufficient—destroyers, torpedo boats, and small vessels having no cold storage room on board, could obtain no fresh supplies, and were obliged to fall back largely on canned foods. At this juncture it happened that on the *Yakumo*, 77 cases of acute gastro-intestinal catarrh occurred in two days, the 23rd and 24th of May. The cause seemed to lie in some fried bean-curd (*tofu*) bought as a relish from a canteen tradesman on the transport *Wakanoura Maru*. The oil in which it was fried was afterwards examined at Sasebo Naval Hospital, and was found to be decomposed.

An instruction was consequently issued from the Sasebo Port Office to the canteen tradesmen in general forbidding them to ship fried fish, meat, bean curd, etc. On another period of two days, the 27th and 28th, acute cases of the same disease occurred also to the number of 77 on board the *Tainan Maru*. This ship having for a long time been on the lookout near Yen-ta-ao and at a distance from supply vessels, the bread she had in store had grown musty, and was spotted with green mould. The mouldy parts were removed and after having been steamed for thirty minutes, the bread was served at table. This, it was suspected, was what caused the disease.

Cases of violent vomiting and purging occurred to the number of 123 from May 31 to June 1 on the *Asama*, 172 cases on June 1 and 2 on the *Mikasa*, and 53 cases on the days on the *Asahi*. The reports from the chief medical officers of these ships threw suspicion on the canned salmon. Hereat Commander-in-Chief Admiral Togo issued an instruction to the captains of ships under his command on the 7th of June, calling their attention to the articles concerning preserved provisions. When the canned salmon was examined on each ship, much was found rotten, decomposed, and putrid. It was decided, therefore, that stricter attention should be paid to the dryness and ventilation of the storerooms on each ship; and that boxes and cans should from time to time be opened to see if any were spoiled: also to subject all provisions to minute inspection by medical officers before being served at table. From June down to July cases of acute gastro-intestinal catarrh still continued to occur. The incessant occurrences on the *Yakumo*, *Nikko Maru*, *Akagi*, *Nisshin*, *Shikishima*, on the converted gunboats, on the *Takasago*, *Itsukushima*, *Kasagi* and *Akashi*, numbered altogether 250. The *Yakumo* attributed the cause to canned roast beef; the *Akashi* threw suspicion on raw sliced fish (*sashimi*); the *Nisshin* reported the cause to be unknown, but supposed it to be the joint effect of food and climate; the *Shikishima* deemed it to be diarrhoea caused by catching cold; the chief medical officer of the *Yashima* declared the cause of the disease in the converted gunboats to lie in the sulphate of copper used in colouring the fine cut *kombu* (sea-weeds), as it happened on board the said boats that the men who lunched on beef and *kombu* and dined on canned salmon and vinegared *wakame* (another kind of sea-weeds)

fell sick at 2 or 3 p.m. that day ; so that he concluded it to be the effect of lunch and not dinner. He asked the Hospital Ship *Saikio Maru* for a chemical examination of the *kombu*, and the apothecary of that ship declared it to be unfit for food. On board the *Takasago* it also happened that beef and *kombu* were served at dinner on June 30 and cases of the same disease occurred in the afternoon. The *Itsukushima* attributed the cause to fish and meat preserved in salt ; the *Kasagi* supposed it to be preserved beef partly decomposed ; the *Akashi* reported that the same symptoms had occurred with officers who ate canned *sazae* (turbo cornutus=the sea ear), and *shoro* (mushroom=reddening root beard). Hereupon Surgeon Inspector Suzuki, attached to the Combined Squadron, determined that the immediate cause of the disease lay in the food ; and expressed his desire to all the medical officers of our ships that they should pay stricter attention to food, now that the hot season had set in, and that the men's digestive organs were apt to get out of order. They should never hesitate to forbid any article of food that might be deemed to be not good. It was further signalized to all the ships that *kombu* they had in store must be returned. Thus the cases of acute gastro-intestinal catarrh that had occurred in such large numbers at one time on board the ships of our fleet came gradually to disappear towards the middle of July.

The system of money allowance for food was at first followed on the repair-ships, hospital ships, water supply vessels, etc. etc., ; but seeing that the food actually taken by men, workmen, etc., of such ships and vessels was so far inferior in its nutritive worth to the food as provided by the Naval Regulations, much anxiety was felt for the preservation of their health. This circumstance had been repeatedly represented to the authorities since April ; and demand was now made by telegram for the alteration of the above system for that of the allowance in kind. Before the permission was obtained, some 15 or 16 cases of *kakke* had occurred among the workmen of repair-ships ; and an immediate danger presented itself of continued recurrences. Immediately on the receipt of the permission asked for, which was granted to the men and employés of hospital ships at the end of June and to those of repair-ships on July 3, the new system was carried into execution, whereby the *kakke* was put an end to before it had spreading into

general prevalence. It was now the hottest part of the year, and in addition to the high temperature thick fogs were so prevalent that more and more difficulties were experienced in the transportation and preservations of provisions. Luckily at this time Talien Bay came into our possession, and bakeries were established at Dalny. In August our victualling vessels had got their cold storage rooms provided, and thus our question of our provision-supply assumed a new aspect.

Shortly afterwards, however, dysentery and abdominal typhus began to prevail at Dalny, and soldiers of our Army fell daily as victims to the diseases. Presently, the ships and vessels of our fleet began to have some sporadic cases. Dalny was then in a dreadful condition as to its sanitation, flies being very abundant owing not only to the nature of the locality but also to the devastations of the recent battle. The Commander-in-Chief Admiral Togo, therefore, issued a notification dated September 19, in which he forbade our men to go ashore at Dalny and Siao-ping-tao: the bread coming from Dalny should be well steamed before serving at table, and special circumspection should be used with regard to vegetables and fruits brought from that quarter. At the same time he notified the Sasebo Naval Station that closer attention was desired for the health of transport ships, and that specially care should be taken not to allow canteen tradesmen to bring fruits with them. Permission was then given to the destroyer divisions, on August 1, for the time being to use boiled barley meal instead of bread. This was in consideration of the fact that the nature of their duty might at any time prevent them from obtaining fresh supplies of bread.

After January 7, 1905 onwards, our squadron at the front began to have frequent opportunities to return home for repairs, and could thus obtain an ample supply of fresh provisions as at any ordinary time; and the additional war-time allowance of within 20 per cent was now put a stop to for all ships in home waters. From that time the supply of fresh provisions was generally abundant, as the maritime communication became freer than before and our transport ships and victualling vessels ran more briskly. In Chin-hai Bay and Tsushima quarters there were facilities for obtaining supplies of fresh provisions from Song-sin and Takeshiki, to say nothing of the frequent opportunities which presented

themselves of buying fresh fish from the fishing corporations at the front as well as from Korean and other boats plying in the neighbouring waters. But our flotillas on picket near Tsunoshima and Okinoshima, with Miura and Aburatani Bays, etc., as their base, were more or less troubled for supplies, as our victualling vessels did not reach them and as it was difficult to obtaining supplies at all ports of call.

Previous to the battle of the Japan Sea, almost the whole of our Combined Squadron collected near the Korean Strait; and the sudden and enormous increase in the amount of provisions required, added to the coming of the wet season, made it very difficult to keep provisions in a good state of preservation. The result was that our base and in our victualling vessels, etc., the power of keeping up the supply failed at last; and it happened not unfrequently that these ships and vessels that had no steam-launches of their own failed entirely in their eager attempts to get their fresh supplies; whilst lookout ships which had no cold storage rooms were often obliged to use preserved provisions, when obliged in consequence of their service at sea to keep away from the base for more than three days.

After the Japan Sea engagement the heat became intense, and it grew more difficult to keep provisions in good condition. One of the victualling vessels, of which there were two, had gone to the north; and what was worse, Takeshiki and Song-sin were cut off on account of the frequent occurrences of dysentery there; so that there was a great shortage of fresh provisions. Luckily, however, the deficiency produced was not very great, as a part of our fleet had left the Korean Strait for duty in the North.

From the end of the first period to the beginning of the second the *Nippon Maru*, *Hong Kong Maru* and a detachment of our fleet were sent south, cruising continuously in the Southern Seas under tropical suns for over a month, during which time they had no chance of obtaining supplies of fresh provisions. These converted cruisers, however, had big ice-making machines and cold storage-rooms, and had taken in plentiful supplies of fresh provisions at their departure from Sasebo, so that they were able to make distribution from time to

time out of their stores for the warships *Chitose* and *Kasagi*. This made an ample supply of fresh provisions obtainable at all times.

The ships dispatched to the north for lookout duty in the straits in northern waters at the beginning of the second period got ample supplies from Hakodate as well as from the victualling vessel. The cold weather also favoured the preservation of food, so that the supply was generally abundant, though most of the ships on lookout service near the Kunajiri Strait, suffered at times from a want of fresh provisions—especially of fresh meat, fish and bread. Our Northern Squadron was supplied principally at the ports touched at, such as Aomori, Hakodate, Otaru, Wakkanai etc., and occasionally from the victualling vessel *Matsuyama Maru*, or the transport *Daigi Maru*, so that their supplies was generally plentiful. While on their cruise along the coast of Sakhalin all the ships in general suffered from want of provisions—especially those smaller vessels and boats whose duty frequently separated them from the main squadron.

The people of Korsakoff and Alexandrovsk having presumably run away with their household effects at the time of our occupation, were in no condition to afford any supplies of provisions; and our squadron had no way of obtaining supplies except from our solitary victualling vessel. But Sakhalin and the vicinity is well known for its fisheries, and fish were readily caught. Our men were therefore permitted to fish for pleasure with nets and lines; and the fish they caught served to fill up the deficiency of fresh provisions, at least partially.

Thus the condition of supply for our ships at the front in the second period was not only more impartial, as compared with the first period, but with regard to the selection of materials, their examination, preservation, cooking, etc., much progress was made, and outbreaks of disease caused by unwholesome, if not rotten and decomposed food, such as were experienced in the first period disappeared almost entirely. On some ships, however, it happened that a part of the fresh provisions and some canned food got decomposed during the summer—this being especially the case with the bread which had to be kept for a considerable period of time after being baked, before it reached its destination. The bread often lost much of its flavour, and some loaves even became overgrown with mould and half-decomposed so that they had to be thrown away.

Our people naturally prefer rice to bread. How much more, then, do they dislike having bad, musty, or mouldy, bread. All this had much to do with health preservation, and the majority of our medical officers expressed the desire that fresh bread should be baked on our victualling vessels, and that the transportation should be improved so that distribution should be made more speedily. Again, it is a rule in our Navy to serve out spirits (under the name of "life-preserver") as a night cap, as well as at supper from time to time. This serving out of spirits is advocated by many, and its merits were demonstrated in the war of 1894-5. It was, therefore, allowed in the present war at times; and it proved not only harmless, but (as a matter of course) invigorating to our men. We are now well convinced of its merit, to a certain extent. Sometimes the *sake* received as charitable contribution to our work was served in place of spirit.

The ships of our fleet carry canteens at which various articles of every day use as well as food are offered for sale, and the convenience and comfort afforded by this arrangement to the men at the front who for many a long month never left their ships must have been very great. The articles of food offered for sale at these establishments are not such as are provided in the Naval Regulations; and yet they are so regulated as to be perfectly harmless to the health. These canteens were originally established on ships and at shore stations, in accordance with the Canteen Regulation instituted in August, 1900, and amended in July, 1903. By this Regulation a President and committee were appointed, and detailed rules were drawn up on each ship and at every shore station for the sale of articles and food. Thus, for instance, on the *Tsushima* it was so regulated that the monthly amount of purchase for each man should not exceed one-third of his monthly salary, that spirituous liquors served out should not exceed one *gō* of Japanese *sake* for one man, one bottle of beer for two men, one bottle of wine for five men in a single day, and that only on Sundays, Thursdays, holidays, and other days specially ordered; that cakes should be packed up—one package for each man; that all canned food should not exceed one tin per man per meal, etc., etc. But what a place of resort it proved to be for men yearning after shore comforts may be seen from the report of the chief medical officer of the *Idzumo*, wherein it is shown how great was the amount

realized by the sales at the canteen. The kinds of food and drink sold were Japanese *sake*, brandy, beer, rum, Korean rice-jelly, millet cakes, cakes, *yokan* (sweet paste), *horai* beans, milk, butter, canned shell-fish, and sea weeds, various sorts of canned pickled vegetables, chestnuts, pears, pine-apples, peaches, etc., in cans, canned eels, etc. The *sake* sold reached enormous figures; and when the contributed *sake* is added to the above, the amount altogether rises to 3,397 gallons from February to October. The entire number of men on board being 750, and supposing them to be all drinkers, it figures out 5.37 gallons for one man, or 75 c.c. per day. If other spirits and the wine allowed from time to time be added in, the amount consumed per head for one day reaches a still higher figure; while the amount of cakes and sweet-meats run up to a still more wonderful amount—the sales for the nine months totalling 88,297 packages, i.e. an average per head of more than 120 and 0.44 per day.

The above is a résumé of the victuallings allowed in the Navy while on active service. The amounts consumed on different ships of the fleet necessarily differed according to the constructions of the ships, and the duties they had to perform. Thus the larger vessels (above 2nd class cruisers) had comparatively simple courses of duties, and were completely equipped with cold storage rooms. Whereas the smaller vessels (below 3rd class cruisers) were in constant requisition for duties of all kinds, whilst very few of them had cold storage facilities. This was especially the case with such torpedo boats, destroyers, etc., as had to depend for their supplies entirely upon their dépôt ships. They often had but small chances of falling in either with their dépôt ships or with victualling vessels, being prevented from doing so by the nature of their duty or by the weather they encountered, etc. They had further no proper store rooms on board, so the difficulties experienced in the preservation of their provisions were very great—and the want of fresh provisions in summer was most serious. Below we give tables for some ships showing the number of allowances made of provisions arranged according to the kinds thereof:—

TABLE 1.—ON THE *Idzumo*.

(For lunch and dinner only) From February 1, 1904, till October 31, 1905.

Article.	Year. Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Average for one month.
Hulled rice, Cracked barley. } ...	1904	—	29	31	30	31	30	31	31	30	31	30	31	335	30.5
	1905	31	28	31	30	31	30	31	31	30	31	—	—	304	30.4
Biscuit.	1904	—	14	8	12	1	7	19	7	—	1	—	—	69	6.3
	1905	—	—	9	—	2	2	5	3	—	—	—	—	21	2.1
Loaf bread.....	1904	—	15	23	18	30	23	12	24	30	30	30	31	266	24.2
	1905	31	28	22	30	29	28	26	28	30	31	—	—	233	23.3
Preserved meat	1904	—	8	9	19	7	11	19	11	—	1	2	—	87	7.9
	1905	—	—	7	—	—	5	7	—	—	—	—	—	19	1.9
Preserved fish	1904	—	7	8	15	4	12	19	12	2	1	2	—	82	7.5
	1905	—	—	4	—	—	—	6	—	—	—	—	—	10	1.0
Fresh meat	1904	—	39	40	17	45	30	24	39	41	41	46	37	399	36.3
	1905	34	44	34	39	37	32	34	52	47	49	—	—	402	40.2
Fresh fish	1904	—	4	—	1	3	7	—	—	11	19	10	25	80	7.3
	1905	28	5	1	7	10	18	14	10	13	12	—	—	118	11.8
Salt fish.....	1904	—	—	4	10	3	—	—	—	—	—	—	—	17	1.5
	1905	—	7	13	11	10	4	1	—	—	—	—	—	46	4.6
Eggs (hen.).....	1904	—	—	1	1	—	—	—	—	—	—	—	—	2	0.2
	1905	—	—	3	3	5	1	—	—	—	1	—	—	13	1.3
Dried vegetables	1904	—	7	16	6	6	14	19	—	—	1	—	—	69	6.3
	1905	—	—	6	2	3	1	10	6	—	—	—	—	28	2.8
Fresh vegetables.....	1904	—	51	46	54	56	46	33	53	60	61	60	62	582	52.9
	1905	62	56	56	58	59	59	52	56	60	62	—	—	580	58.0

The figures denote the number of times the allowance was made.

TABLE 2—ON THE *Tsushima*.

(For lunch and dinner only) From February 1, 1904, till October 31, 1905.

Article.	Year. Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Average for one month.
Hulled rice. Cracked barley. }.....	1904	—	29	31	30	31	30	31	31	30	31	30	31	335	30.5
	1905	31	28	31	30	31	30	31	31	30	15	—	—	288	28.8
Biscuit.	1904	—	1	7	8	1	15	5	6	2	—	1	2	48	4.4
	1905	—	—	2	1	4	11	1	—	1	—	—	—	20	2.0
Loaf bread.....	1904	—	13	24	22	30	15	26	25	28	31	29	29	272	24.7
	1905	31	28	29	29	27	19	30	31	29	15	—	—	268	26.8
Preserved meat	1904	—	—	12	16	1	16	10	10	5	—	—	1	71	6.5
	1905	—	—	6	5	4	5	3	3	3	—	—	—	29	2.9
Preserved fish	1904	—	3	14	17	2	21	12	10	10	1	—	3	93	8.5
	1905	1	1	4	5	2	4	5	6	3	—	—	—	31	3.1
Fresh meat.....	1904	—	21	34	19	40	21	29	33	35	42	41	43	358	32.5
	1905	38	30	37	34	40	23	34	39	30	19	—	—	324	32.4
Fresh fish	1904	—	4	—	5	19	2	9	7	9	18	17	13	103	9.4
	1905	22	25	12	13	12	21	19	9	20	10	—	—	163	16.3
Eggs (hen.)	1904	—	—	2	3	—	—	2	2	1	1	2	2	15	1.4
	1905	1	—	3	3	4	7	1	5	4	1	—	—	29	2.9
Dried vegetables	1904	—	—	1	9	2	21	6	6	10	—	—	—	55	5.0
	1905	—	—	3	1	1	6	2	2	3	—	—	—	18	1.8
Fresh vegetables	1904	—	28	61	51	60	39	56	56	50	62	60	62	585	53.2
	1905	62	56	59	59	61	54	60	60	57	30	—	—	558	55.8

The figures denote the number of times the allowance was made.

TABLE 3.—ON THE *Ikadzuchi*.

(From February 6, 1904, till October 31, 1905.)

Article.	February (from 6)	March.	April.	May.	June.	July.	August.	September.	October.	Total.	Average for one month.
Hulled rice, } Cracked barley. }	48	62	60	62	60	62	72	85	86	597	66.33
Bisenit	14	9	19	15	24	10	—	—	2	93	10.33
Loaf bread	10	22	11	16	6	21	21	5	5	117	13.00
Preserved meat	2	5	24	27	1	7	16	15	26	123	13.67
Preserved fish	9	10	15	13	1	8	8	17	26	107	11.89
Fresh meat	23	36	21	16	18	12	12	28	10	176	19.56
Fresh fish.....	14	—	—	—	37	32	24	—	—	107	11.89
Fresh fowl.....	2	—	—	—	—	—	—	—	—	2	0.22
Eggs (hen.)	9	—	6	3	2	—	—	—	—	20	2.22
Dried vegetables	9	22	3	3	42	13	20	11	31	154	17.11
Fresh vegetables	39	40	47	47	18	49	40	49	31	360	40.00

N. B. The figures denote the number of times the allowance was made

Number of allowances made of the articles of taste and relish are here omitted.

SECTION III. DRINKING WATER.

The quantity of fresh water required on our ships and vessels was considerable and its supply has a great deal to do with the sanitation of the fleet. Of the ships and vessels at the front, those of latest construction are completely equipped with water distilling apparatus; yet even so it is no easy matter to supply the whole quantity of water required. How much more so, then, is this the case with other ships? In the war of 1894-5, fresh water supply ran so low that the amounts allowed per head had to be cruelly curtailed. In the present case, arrangements were made for the water distilling ships to be fitted with distilling apparatus, so that they might be able to produce distilled water in abundance for distribution to all the ships and vessels at the front, while a great number of transport ships helped out supply by furnishing water which they took on board each time they returned home.

The amounts consumed naturally differed according to the classes of the ships, the dates of their construction, the number of their complement, their allotted duties, the climates encountered, etc.

To quote from the report by Fleet Surgeon Ishihara, chief medical officer of the battleship *Asahi*, about the consumption of drinking water and fresh water for sundry purposes during the year ending 1904 :

“For drinking purposes distilled water was taken for the most part. The ship had two distilling plants, by working one of which for a day and a night without interruption, about 18 tons of distilled water were procurable. By working both we could get 36 tons. We endeavoured to keep at all times from 50 to 60 tons of water in our tanks; so that we felt no want for drinking water. But it was our wish that the water supply should be better regulated by means of watering vessels, transports, etc., and that fresh water for other purposes than drinking should be more plentifully supplied. According to the established rules for the *Asahi*, the distribution of water runs as below :—

1.00 *sho** per head for washing for all above warrant officers.

0.56 „ per head for washing for petty officers and men.

*Japanese measure of capacity equal to 1.804 litre.

4.00 *sho* per head for bathing after watch for engineering officers.

1.00 „ per head for bathing (at times) for all above warrant officers.

0.56 „ per head for bathing for petty officers and men (once or twice per week)

4.50 or 5.00 *sho* per head (once a week or every two weeks) for washing clothes for petty officers and men.

The amount of drinking and other water consumed during the period from February to December, 1904, was 3,324 tons at the average of 9.92 tons per day and 6.56 *sho* per head per day. For the period from January to October, 1905, it was 2,710 tons, the average being 8.91 tons per day and 5.93 *sho* per head per day.”

Of the 1st class cruisers, we will take, for illustration, the *Idzumo* which had two distilling plants, together producing water to the amount of 48 tons by working a day and a night. Her water tanks, large and small, were altogether five in number and capable of holding 104 tons of water in all. These were all cemented on their inner surfaces. The fresh water consumed for the period from February 6 to the end of December, 1904, amounted to 2,783 tons for drinking and 542 tons for other purposes, together making 3,325 tons with an average of about 10.08 tons per day for drinking and other uses. The total amount consumed during the period from January 1 to October 16, 1905, was 3,375 tons at the average of 11.68 tons per day and 8.92 *sho* per head in one day.

For drinking purposes distilled water was exclusively used, and for other purposes such water was employed as was supplied by other ships or by the Takeshiki Secondary Naval Station, so that no difficulty was experienced in obtaining water.

On the 2nd class cruisers, too, distilled water was satisfactorily provided for drinking. Ships of this class, differing as they do, in size and date of construction, had each of them distilling apparatus installed. To summarize the actual condition on the *Tsushima* (for instance), this ship used, for cooking as well as for drinking, distilled water of her own making from the beginning, the fresh water supplied from other ships being applied to other purposes. The report by her medical officer says: “The distilling apparatus on either side of the ship,

which are each capable of producing 15 tons of water in 24 hours, actually forced 8-10 tons for most of the time. The water, as it runs out, is conducted into the fresh water tanks below the lower deck, whence it is pumped up into the water tanks in the kitchens fore and aft on the upper deck. The average quantity required per day for drinking and other uses being not more than 3.37 tons, the two distillers when worked alternately could produce a quantity more than sufficient. The fresh water tanks are capable of holding as much as 30 tons, and, when full, they held enough to support the ship for ten days. The total amount of water consumed for drinking and other purposes for the period from February 6 to the end of December, 1904, was 1,019.3 tons at an average of 3.09 tons per day and 5.53 *sho* per head per day; and the same for the period from January to October, 1905, was 969.9 tons, the average being 3.36 tons per day and 5.43 *sho* per head per day.

With ships below 3rd class cruisers some of them experienced at times great difficulty in obtaining drinking water. Such of them as were of recent construction had, indeed, powerful distillers provided, but those of older construction having no equipment had necessarily to depend on water distilling ships and transports for their supply of fresh water; and further, their water tanks, being of a smaller capacity, made it impossible for the ships to keep a large quantity in reserve. When, therefore, their duty made it impossible for them to fall in with a transport vessel for some long period, their fresh water would stop short and then the hardest toil and greatest care often barely enabled them to tide over the crisis. Such, indeed, was the case with the gunboats on service in the Tai-long River and the Ya-lu quarters. In the second period and after, a certain deficiency was, felt by some of the ships on picket duty about Okinoshima, Mishima and Tsunoshima and as also in the flotillas that moved along the coasts of Sakhalin; but the want was not so keenly felt as in the first period, since communications by sea were now generally free, the means of obtaining water supplies much extended, and there were many more chances of the ships' returning to home ports. Thus the degree of hardship felt was by no means so great as during the first period. Reports from the medical officers of different ships concurred in saying, that the fresh water supplied by transport vessels often contained large quantities of salt—enough

at times to give a saline taste to the tip of one's tongue. Chemical examination showed that really good drinking water was but seldom to be found. Indeed, it happened, as for instance, when the 7th division of our fleet played an independent part in the Tai-long River and Ya-lu quarters that the regular supply of drinking water became a matter of considerable difficulty. After a close but fruitless search on land for springs of water, we were overjoyed to see a transport vessel coming towards us. It seemed like a solution of our perplexities: but when we tasted the water she had brought us, what was our disappointment to find that the water was unfit to drink!

The fresh water carried by our transports was in most cases taken from the water works at Sasebo, and the transport ships that carried a medical officer took in water into them after an inspection by that officer, so that the water must have been pure and good at first. The changes it underwent after being taken in were most probably due to the fact that the cleansing of the ships' tanks had not been thoroughly done, and that on her return voyage she had taken sea-water as ballast into her bottom tanks: also that some of these ships had leaks for sea water to leak in. These points were well looked into and the quality of the water was subsequently much improved. We took the precaution with regard to drinking water to have it tested not only before it was taken into a transport vessel, but also at the time of receiving it into a ship of the fleet; and whenever it was found unfit for drinking, such water was turned to sundry uses such as feeding the boiler. Besides, the water tanks were cleaned out from time to time, and the least suspicion of infection was removed by steam sterilization.

Our destroyers for the most part experienced no shortage of drinking water, having water tanks capable of holding about 3.5 tons, and their distillers producing over 3 tons per day, while the amount of consumption per day was never more than one ton. To add to all that, water was supplied from time to time from watering vessels, transports, torpedo-dépôt ships etc.; and some of them had water tanks specially provided.

To sum up, the water supply during the war was sufficiently obtained by our ships and vessels, those on service off Port Arthur obtaining it from watering vessels and transports, those having their base in Chin-hai Bay and off

Tsushima, from Takeshiki water-works and from transport vessels, and those in the Hokkaido quarters, from watering vessels and transports, besides that procured from water works at Ominato, Hakodate, Otaru, etc. Those which had a complete distilling plant on board used distilled water to drink, exclusively of their own making. It is indeed true that the ships and vessels on service off the Tai-dong River and the Ya-lu met with considerable difficulties for a time, as related above; but the pressure was soon relieved when they turned their course towards Port Arthur.

After all, however, if the supply had been still more plentiful, the benefit to the general health would have been very great; as the surplus would have allowed an unstinted use for bathing and washing. Among the reports from the medical officers of our ships, there were, indeed, many in which a desire was expressed that the water supply might be made more complete, if it could be practicable.

Men of the engineer branch always drink large quantities of water, owing to nature of their service—especially in summer when it is very hot. The quantity drunk by them is really wonderful. We know from the experience of many years that the functions of stomach and intestines are disturbed by the practice; and that more cases of gastro-intestinal diseases occur among them than in any other class of our men.

But, working as they do all over sweat in the extremely high temperature of an engine room, overdrinking becomes an uncontrollable physiological necessity. Medical officers have already tried various means of relief—such as adding a little acid to the water in order to reduce the quantity of liquid needed to quench thirst, the mixing it with starch or rice-gruel, or substituting parched barley water, etc. None of these attempts has availed much. The courses adopted by the different ships of our fleet were by no means uniform—on most of them nothing was given but lukewarm distilled water.

An extract from the report by the chief medical officer of the *Tsushima*, runs as under:

In the boiler and engine rooms, however excellent their ventilation may be, the temperature stands over 100° F. often reaching as high as 135°. Working in such a hot room, it is no wonder that our stokers get thirsty and drink a

great deal of water. We have in our boiler and engine room a water cistern containing about 4 *sho* of boiled water. If this were left for our stokers to drink from freely, they would naturally drink too much and upset their digestive organ, as was but too often proved by experience. We, therefore, tried to make them drink as far as possible in short sips rather than long draughts, and encouraged them merely to gargle instead of swallowing; at times we mixed a little sugar or starch or citric acid in their drinking water with a view to help quench their thirst. We found acid to be the best for stopping thirst; but by far the greater number of the men preferred to drink tasteless water; so that in actual practice we chiefly used boiled water cooled down in sea-water. The following will show the amount of water drunk by our stokers per head, while on watch, during winter as well as summer season; in the height of summer about three times as much water was drunk as in winter:—

Season	Room	No. of Persons on a Watch.	Water required during one Watch	No. of Watches per Day	No. of Persons per Day	Consumption per Day	Average of 4 Hours' Watch per Head
Winter	{ Boiler room	14	^{lbs} 4.0	6	84	^{sho} 24.0	^{sho} 6.28
	{ Engine room	8	2.6	6	48	16.0	0.33
Summer	{ Boiler room	15	14.0	6	90	84.0	9.93
	{ Engine room	12	16.0	6	72	96.0	0.133

According to a calculation made by the chief medical officer of the *Adzuma* relative to the amount of water drunk by the men of the engineer branch during summer, the total amount of drinking water for the entire number of 62 men in a 4 hours' watch during navigation was 65.5 *sho* at an average of 1.04 *sho* per head, the largest quantity drunk by an individual being 1.4 *sho* and the smallest 0.5 *sho*.

From the above records we see that the amounts of drinking water required by our stokers on watch during summer are almost the same in the two ships; from these we believe that the general conditions may easily be conjectured.

One thing deserves to be noted by the way. There was a rumour, when Talien Bay came into our power, that the Russians had poisoned the spring of

Ta-ku-shan at the time of their flight. On hearing this rumour Captain S. Nakamura, Chief of the Staff of the Third Squadron, took some water from the spring on the 15th of June and sent it to the Hospital Ship *Kobe Maru* to have it examined. No trace of any poison could be found nor any bad bacilli, and some of our own ships took in water from this spring for their use afterwards.

Many reports were forwarded from medical officers as to the qualities of fresh waters procurable at places their ships had to touch: but they are omitted as being scarcely germane to our subject.

SECTION IV. CLOTHING.

The clothing is supplied according to the Regulations. To summarize: the clothing worn at ordinary times, the winter dress for petty officers and men is an ordinary suit made of blue serge, with flannel undershirts, white cotton underwear and drawers, and summer dress is of white *katsuragiori* with underwear the same as above. They wear stockings of white cotton, and shoes. In summer their caps are covered with cap covers of white cotton, or hats made of hemp-palm leaves are worn. For protection against cold and moisture, an overcoat made of blue cloth and a water-proof coat are given them. For those above warrant officers the dress is, of course, regulated by rules, but the underwear is left to their discretion.

In times of war a necessity naturally arises for furnishing additional clothing to suit climatic conditions. At the beginning of the present war, Naval Minister Yamamoto published an instruction that men of the Navy, civilians in the naval service, workmen and coolies dispatched to localities near Korea, North China and the Russian Maritime Province should have clothing granted or loaned for protection against cold. These grants and loans were to be for a period ending on March 31, and were to be made whenever a necessity arose. The term was afterwards prolonged until April 30. See Chapter I, Book I, of this book for details respecting these articles.

Cold weather rig was to be supplied from the Direction of Accounts and Supplies at the Sasebo Naval Station, but the stock in hand being at first rather short, arrangements were made, with the permission of the Vice-Minister, to serve



ON WATCH IN COLD WEATHER RIG.

it out in rotation, first, to destroyers and torpedo boats, secondly, to ships below 3rd class cruisers and to special service corps, thirdly, to 2nd class cruisers, fourthly, to 1st class cruisers and battle-ships, and fifthly, to ships on special service. Demands for the grants were to be sent in the order of necessity. This additional grant of clothing was of very great importance at the time, as was afterwards proved by the fact that very few cases of frost-bite occurred during the whole course of the operations in northern seas in spite of the severity of the climate. We had to face winter; and on September 30 an order to the same effect was issued with regard to grants or loans of clothing for cold weather. The period was to commence on November 1 and to close on April 30, 1905; but some crews on active service off North Korea and elsewhere continued to wear either the whole or a part of the clothing until about June, with the same excellent results as in the previous year.

At the beginning of the second period when our ships were operating among the icebergs around Kumajiri Strait and North Korea, the cold weather rig proved of no small benefit; but the prescribed rig being insufficient, permission was given to supplement it with articles of private wear. By way of illustration, we append a summary of the kit of men below petty officers on the flag-ship *Idzumo* of the Second Squadron while convoying our land-forces near Syōng-jin from the end of February to the beginning of March, 1905:—

Upper Garments	Nether Garments	Over Garments	Bedding
1. White cotton knitted under-shirts(extra).	1. Cotton flannel drawers(extra).	1. Cloth cap (with puggery).	1. White woollen blankets—3 pieces.
2. Flannel shirts.	2. Flannel drawers as cold protectives.	2. Woollen comforter as cold protective.	2. Red woollen blanket—1 piece.
3. Black wool knitted shirts(loan).	3. Serge trousers	3. Cold protective overcoat (for sentry and men on lookout).	3. Straw bedding for hammock—1 piece.
4. Cotton underwear	4. Long woollen stockings (thick and home knit).	—	—
5. Flannel belt (private property).	—	—	—
6. Knitted woollen gloves.	—	—	—
7. Serge jumper.	—	—	—

When the Northern Squadron started from Ominato at the beginning of July, it was expected that the northern seas would still be very cold, and the nights particularly severe. Loans of cold protective overcoat and half-boots were made over and above what was the prescribed limit by the Regulations, together with grants of long stockings. This example was followed by other ships of the fleet. The cold, however, was not so severe as had been anticipated; so that the extra clothing was actually used on ships operating in the seas north of Sakhalin; the rest had nothing more than a simple addition to the shirts worn, excepting that a protective overcoat was provided for men on sentry at night or in rainy weather, and for those sent overboard. Here it is not out of place to protest against the quality of the clothing served out. The black woollen shirts were badly dyed, and when worn stained the skin and the rest of the clothing so badly, that on some ships they had to be washed several times before the men were allowed to put them on. This was especially annoying as the water supply was not plentiful enough to allow of unlimited bathing and washing; and there was an additional evil. The bad dye irritated the skin and in some cases produced eruptions. Complaints were made more than once that the sleeves might well have been made longer, as in the shirts loaned to those above warrant officers; and also that wider sleeves would have given more play to the arms. The knitted gloves (according to some) were lined with soft woolly cloth which, when doubled between the fingers, made it hard to use the hand freely at work; according to others the gloves with unlined fingers were worthless against the cold. As for straw shoes, their keeping the feet warm, their being less slippery on frozen decks, and their making no noise when worn on sentry duty at night, were so many points in their favour, and they were much worn on a few of our ships; on the other hand, they were of rough make, they were troublesome to handle and their further inability to keep out the wet prevented them from being adopted by the rest. Our half-boots again were most favourably spoken of as affording a remarkably good protection against cold as well as wet. Our thick-soled black *tabi* (socks) are light enough to give agility in motion, but are less protective against cold. A worse feature is that, if once they get wet, nothing will make them warm. The remaining arti-

cles of clothing were as a rule well received—especially the overcoats which proved indispensable for officers as well as men. They had however one drawback : being made of one size, they were too short for tall men ; the collars were too low, and when turned up, they covered the neck only, without reaching the ears.

In the future such overcoats might well be made of two sizes, with deeper collars, so as to give a more complete protection against cold.

With regard to protective garments against heat, either loans or grants were made on June 22, 1904, of puggeries for summer hats, summer caps of special make, and summer hats (as detailed in Chapter 1, Book 1). Special permission was also given for these to be worn during every summer and by the men on ships cruising in tropical regions, as, e.g., on ships of the Southern Detachment. To those above warrant officers and cadets *khaki* summer suits were granted. These had been purchased for distribution out of the war-relief fund and proved a great boon where laundry facilities were few and far between. The material, however, being of *katsuragi* texture, and therefore thick and heavy, had the fault of not being cool enough. It was observed by some that a lighter and cooler material might just as well have been selected. Our summer hat specially made for wear in places directly exposed to the sun such as the upper deck were found most useful and met with universal approbation. On some ships hats were loaned on demand to 1st and 2nd class petty officers (for whom no such provision is made), and proved most welcome : many of the reports received inform us, however, that the puggeries were rarely used.

One of the important points of sanitation with regard to clothing is washing. In war-time, crews on active service have fewer opportunities for washing clothes than is ordinarily the case. This is due partly to the nature of their service, partly to the care that must be exercised with the supply of fresh water, and partly to considerations of weather. Fleet Regulations call for washing to be done twice a week ; but the regular washing days could not be kept up during the operations ; each ship did her best, and no uniformity could be secured. Washing was generally done with fresh water taken in from transport vessels, whenever the clothes had been made extra dirty hard working,

such as coaling. We may say that, on the whole, clothes were washed never more than once or twice a week, and never less than twice or thrice a month.

The airing of bedding and clothing, a thing most desirable under favourable circumstances, was generally impracticable, more than, say, once a month. Very often it was only once in every two or three months.

The strictest vigilance was observed on all ships during the night: no hammocks were got out, and the men slept on blankets spread on the decks, and the blankets necessarily got dirty and soiled. On November 11, 1904, the Minister of the Navy issued an order, that the blankets in the possession of our petty officers and men on board the ships at the front might, if too much soiled and beyond washing, by special permission be exchanged for clean ones on the ships' entry into a home port; and on the 20th the following instruction was dispatched. From that date changes of blankets came to be feasible on our ships, even when washing was out of the question.

By Secretarial Order No. 4459, 1904, it is here notified that blankets in the possession of our petty officers and men, which want washing, may be exchanged for clean ones, whenever there is time enough to do so between the entry of a ship into a Naval Port and its exit therefrom. Such petty officers and men may receive loans of proper blankets, and blankets requiring washing shall be collected by the officer in charge, to be returned to the ship when washed.

SECTION V. VENTILATION AND PROTECTION AGAINST COLD AND HEAT.

The war broke out during the coldest months of the winter, and it was certain that our maritime operations would be executed in Northern waters. How were our ships to be kept warm?

We were not concerned about our larger vessels: they were all fitted with steam heating. But many of the vessels below 2nd class cruisers had no steam-heat installations at all, or installations limited to the captain's cabin, the ward room, and the gun room. These steam-heaters were, besides, not powerful enough to heat the whole interior of the ship, and it was necessary on most of our ships

to study how the rooms for men and petty officers, as well as all other places, could be kept supplied with artificial warming. We summarize below from the reports of our medical officers.

On the battle-ship *Fuji*, it was arranged, that whenever the temperature on the middle deck (the coldest portion of the crew spaces) fell below 40°F., steam should be turned on, and this commenced to be done from January 25, 1904. On the *Asahi* the middle deck as well as 1st-9th compartments of the lower deck were made into sleeping quarters for the men. In the compartments from 3rd to 9th on the lower deck, there was protection on either side calculated to keep in the heat; and the heated air coming at all times from the engine and boiler rooms made special heating needless; but in the 1st and 2nd compartments, on the middle deck, the port-holes being kept open all through the night, and the chilly air coming in freely, made the cold unbearable. The men sleeping in this part were consequently removed to the compartments aft of No. 3. The 1st and 2nd compartments on the lower deck had been constructed without suitable arrangements for protection against cold; both sides, being of iron plates, were excellent conductors of the cold outside. Further, between the 2nd and 3rd compartments there was an armoured-door and a watertight bulkhead that was always shut, so that it never allowed the warm air from the 3rd compartment aft to pass through. This made it the coldest portion in all the ship; but fortunately there were hot-air tubes on both sides, through which the warm air could be sent up. These tubes were worked alternately for thirty minutes at a time from sunset until the next morning, when it was time to get up. One night the temperature in the compartment was taken, and the results obtained were proportionate and satisfactory, as shown below:—

	Sunset	Midnight	5 A.M.
Lower deck first compartment. (°F.)	54	62.5	62.5
Second compartment (°F.)...	60	65.5	66.5

The use of hot-air tubes was stopped on April 16, when the temperature at noon stood at 50°F.

All our 1st class cruisers had steam-heaters installed in the crew spaces, so that no anxiety was felt in their case. Of the ships below 2nd class cruisers, the ones with steam-heater even in the crew spaces were exclusively of recent construction (such as the *Kasagi*, *Chitose*, *Tsushima*, *Nitaka*, etc.); while all the rest had it only in the captain's cabin, the ward room and the gun room. On most of these cases, the heating power was insufficient when the cold was very severe, and stoves, etc., were used as auxiliary heaters. For instance, on the *Tsushima*, steam was turned on in the heaters and fire kept burning in the stoves from the time of "all hands turn out" in the morning until the "commander's rounds" at night, for a period from February to April, 1904. The other ships, viz., the *Itsukushima*, *Matsushima*, and *Hashidate* took in charcoal for heating purpose.

Of the 3rd class cruisers, two only had steam heaters in the crew spaces, viz., the *Suma* and the *Akashi*. These two ships had braziers (*hibachi*) provided against the time of the great cold; but all the time they were at the front, the temperature which was as low as 18°F. in the chart-room, was kept up in the crew spaces by steam-heaters alone at about 50°F., so that their braziers were not needed. On the despatch vessel *Chihaya* and the gunboat *Uji*, steam-heaters were provided in the crew space; but on the *Chihaya*, stoves were put into the captain's cabin and the ward room and braziers into the warrant officer's room, while in the crew space, when the temperature got lower than 50°F., steam was turned on through the tubes. On severe weather, however, the heating apparatus was found too small for the capacity of the room, and the steam pipe had a leak at the joint, which caused a waste of good steam and was liable to fill the room with moisture. Braziers were therefore substituted for a time. Then the fumes from the charcoal gave many of the men bad headaches. This was because the ventilation had been obstructed by the removal of the ventilators. Hereupon the use of braziers was put a stop to; and after the steam-pipes had been repaired, we resorted exclusively to steam heating.

On other ships which had no steam-heat, they resorted either to stoves or braziers; but proper ventilation being secured, no case of gas poisoning occurred.

As an illustration, let us take a brief summary from the report given by the chief medical officer of the *Chokai*. On this ship, two big braziers for warming the crew space were placed on the lower deck forward for 62 days, from February 15 to April 16. In using these braziers, care was taken to secure proper ventilation by opening the two hatches and all the side scuttles, whenever the weather was calm; and the fire was extinguished under strict supervision as soon as the sun set. On the lower deck forward was the warrant officers' room, and here, too, braziers were employed with perfect immunity. The amount of charcoal consumed during this period was 40 bags, equivalent to about 280 *kan*.* Stoves were provided in the captain's cabin and the ward room. By these arrangements, the men on sentry duty at night had nothing at which to warm themselves before going to bed after their spell of duty, and were obliged to lie down in the coldest of beds after having faced the coldest and most penetrating of weather. They certainly deserve our sympathy; but the dread of the harm that might come from burning charcoal in those narrow spaces rendered precaution necessary. The heating on the *Nisshin* and *Kasuga* was peculiar to them and was done by electricity. The practical merits of this system were tested at the beginning of the winter of 1904. The report from the chief medical officer of the *Nisshin* says: "It works quite well in the admiral's and captain's cabins; but the ward room is too spacious for the heating to be perceptible, and charcoal was therefore used in addition. The ward room and the warrant officers' room were warmed entirely by charcoal fires; and the crew spaces having no heating conveniences of the kind, were heated with hot air, but only when the cold was unbearable. This was done by shutting up the engine room hatches on the upper deck and opening the doors on the middle one. By this process, however, the foul air in the engine-room was drawn into the crew's space. It was far from being an ideal plan, but necessity knows no law, and something had to be done.

Further, to protect our sentries on night watches from cold, the workshop fire on the upper deck forward was fed with charcoal, that they might warm their hands and feet at their turns.

With destroyers and torpedo boats the difficulty lay not so much in pro-

*A *kan* is equal to 8.28 pounds.

tection from cold as in avoiding heat. It was hard enough to protect our men against cold alone. These vessels had no warming equipment at all, such as the other ships had. Their thin iron plates were powerful conductors of the cold without, waves that washed the deck while the ship was running got frozen in such a way as impede the activity of our men (how much harder was this in foul weather!); and there was nothing to warm them with but some stoves and braziers. But the hardships borne in hot weather were even greater. Many are the tales of sufferings from heat that are to be found in the reports from medical officers serving on destroyers. We will take one from the report by a medical officer on board the *Kasumi*:—

“On a destroyer (he says), three of the four boilers are always heated in order to keep up steam. The boat lies in most cases adrift before the enemy's port, and there is but seldom a chance of taking advantage of the motor fan. No awning is allowed, the rays of the sun strike direct on the thin iron plates of the upper deck and sides, and make hot enough to burn the hands that touch them. We learned from experience what it would be to “lie in a burning oven”, as our phrase goes. The heat at night, instead of diminishing, became only more sultry and oppressive. The side scuttles were closed for fear of the light leaking out. The heat was oppressive everywhere, but especially in the second compartment which stands next to the first boiler, being partitioned off by a thin iron plate, which conducts the heat only too well, into the tightly closed apartment. Most of the men would get upon funnel casings or under the bridge to get a little sleep. It was certainly bad for their health to sleep exposed to the open air of night, but the intense heat below prevented them from sleeping at all and made them fatigued. It was, therefore, tacitly permitted in most cases, being necessitated by adverse circumstances, as the lesser of two great evils.”

Electric fans were put up on destroyers and torpedo boats, and thus the heat below was more or less tempered.

In the kitchens, also, of destroyers the temperature rose to an extraordinary height, e.g., once as high as 130°F. on the *Murakumo*. These rooms were very small and mostly located close by the boiler-room; besides containing

cooking stoves, dynamos, and such like. It was extremely hard to work under such conditions. Internal reconstruction will sooner or later be a *sine qua non* on most of these vessels.

The heat oppression was equally great on other ships and vessels. The modern tendency in the construction of the ships of war is to make them more powerful by means of a wider application of steam power; and the heat below becomes naturally more intense. Our only means of combating the evil was to make the ventilation as perfect as possible. But perfect ventilation is incompatible with strength of construction. In short, the ventilation on modern warships has to be far from perfect. Moreover the war-time activities of these vessels seldom permit of the fire in the furnaces to be extinguished, the ventilators, their only organ for changing the air in times of peace, have been removed in preparation for action, the side scuttles, etc., have been shut to prevent the light being seen from outside during the night—everything tends to make the heat in the interior insupportable.

We tried all possible contrivances for ventilation. Wind-sails were used; blowers were fitted to the windows; an awning was put up over a part of the deck: at night, when the heat was excessive, lights were put out and side scuttles were opened from time to time, etc. All this was often quite unavailing: the men suffered from headache and dizziness, and could not get proper sleep. Thus, for instance, in the 5th compartment on the lower deck of the battle-ship *Mikasa*, the cabin temperature, as taken six times each day during the month of July 1905, averaged 91°F. at the lowest and 98°F. at the highest. On the first class cruiser *Asama*, while at anchor in Chin-hai Bay with sufficient steam always up run at the speed of 10 knots an hour, the results of measurements taken thrice a day showed a temperature on the upper deck of from 68°F. to 79°F., while that of the 3rd, 4th, and 5th compartments on the middle deck registered from 83°F. to 89°F., and that of the dressing stations fore and aft in the 6th and 7th compartments on the lower deck from 94°F. to 100°F. From this it may easily be conceived how high was the temperature in the dressing stations when the ship was running at full speed. On the *Takachiho* the temperature on the mess-deck taken at 11 o'clock every night, while the ship was at sea,

during the month of July, 1905, rose as high as 89°F.; on the *Akashi* the temperature below was exceedingly high in summer—especially in the passage on the lower deck on both sides of the boiler-room—often rising as high as 110°F. when at sea, so that the men who had their hammocks in this part of the ship finding the heat insupportable, removed their berths to the fore part on the lower deck.

The ones that suffer most from heat in summer are the men of the engineer branch. Take, for instance, the report from the warship *Adzuma*, which says: The mean temperature on the upper deck from July 5 to 31, 1904, was 78°.74F., and that of the engine-room was 110°.05F., and that of the boiler-room 99°.63F.; from August 1 to 15 the mean temperature on the upper deck was 82°F., in the engine-room 110°.08F.; in the boiler room 102°.96F.

The highest temperature recorded in the boiler room was as high as 138°F. On all the other ships and vessels the temperature in the boiler and engine rooms was much the same, being notably higher on destroyers and torpedo boats.

SECTION VI. VARIOUS FORMS OF ACTIVITY, SLEEP, BATHS, KEEPING UP THE MORALE OF THE MEN.

That men engaged in warfare are active is a self-evident proposition. A report by Surgeon General Sudzuki, Medical attaché to the Combined Squadron says:

“ Battles, general quarters, cruises round the picket posts, watching the movements of the enemy, etc., all require extraordinary exertion on the part of the men; but these forms of activity are really in practice as a part of the daily routine even in peace time; coaling in war time alone can be said to be a special form of activity.

“ Ships and vessels returning to the base after a cruise fall at once to the work of coaling in spite of the fatigue of body and spirit resulting from their having been at sea for many a long day fighting against wind and waves, beset with thick fogs, and in frequent combats with the enemy. The work of coaling engages every one on board—from the commander, chief engineer, and divisional officers down to the boys,—all in dirty overalls with grumpy faces and looking

like negroes. A warship coaling is really a moving sight, and the emotion does not become less vivid when we see august personages, such as Prince Higashi Fushimi, commander on the *Chitose*, and the young Prince Fushimi, divisional officer of the *Mikasa*, working like the rest at this disagreeable task. The presence of these officers proves a great encouragement to the rest, and several hundreds of tons of coal are taken aboard in wonderfully short space of time.

"This work being finished, general cleaning is performed: so that in most cases the work, if begun at 8 a.m., finishes about 5 or 6 p.m. When the work is done the men take a sea-water bath just to wipe away the coal dust, and then make themselves quite clean and comfortable by washing in fresh water. This kind of work has to be done once or twice every week on destroyers and torpedo boats, and once a week on ships ranking above cruisers."

Attention is called to the labouriousness of coaling by all the medical officers in their reports. The report from the front submitted by Fleet Surgeon Ishihara, chief medical officer of the *Asahi*, says:

"Our men in general attend to their daily routine and other duties as in ordinary time; and at night they are posted on picket duty, besides having to work at coaling. Their work is generally of a very exacting nature;—to ride upon angry waves "under a wintry heaven" and then serve in picket boats throughout the night; to brave the cold wind, tide and rain throughout the day in the discharge of their shipboard duties, and amidst the excitements of warfare, —are occupations which must be seen before they can be properly estimated. During the period from February to December 1904, our ships coaled in all forty times with an average of 3.6 times per month; and the total amount of coal and men taken in was 15,858.9 tons. Take an average of the number of hours taken employed, and you get the rate of 0.254 tons for one man per hour."

An investigation made on the warship *Idzumi* shows that for the ten months from January to October, 1905, the average per month stood at 3.5 times, the average for one man per hour being 0.52 tons.

With smaller gunboats—and especially with destroyers and torpedo boats—coaling, as a rule, is even more frequent, owing to the constant activity of these smaller craft.

There were not a few cases of injuries received during coaling at the beginning: gradually, however, as the men grew skilled in the work, the number of injuries decreased. The work is necessarily attended with the inhaling of coal dust, and the medical officers were afraid of the effect this might have on the health of men. Some attempted to prevent it by putting pieces of cloth over the men's mouths and noses; others proposed to make the men use respirators while at work, and the experiment was actually tried in one or two cases. But these contrivances were all found to be totally impracticable: when men are working hard, they must be allowed to breathe freely. Surgeon K. Akimoto, chief medical officer of the *Kumano Maru* contrived a new kind of respirator by making a "gourd-shaped" frame of copper or brass fitted to the curve of the nose, cheek and chin and a presser, and putting between the frame and the presser two layers of absorbent cotton gauze on a sheet of bleached cotton with over it a layer of cotton floss of uniform thickness and covering the whole with a piece of flannel to filter the air for breathing with a round cotton pad at the bottom, where the respirator fits the face. His report says that his invention was tried with fair success; but it requires further experiment to demonstrate that it does not really obstruct the breathing.

It was also ascertained in many cases that the coal dust flying into the eyes led to conjunctivitis—English coal and briquettes being more particularly harmful, as compared with Japanese coal. Goggles were tried as a precautionary measure but with no success. Fleet Surgeon T. Saigo, chief medical officer of the *Mikasa* made the experiment of introducing eye-shades for stokers when tending to fires, as well as goggles for use in torpedo boats, but the result obtained was unsatisfactory, and the conclusion came to was that they were totally impracticable, unless their construction can be entirely remodelled,

Work quite as laborious as that of coaling is the work of the men in the engineer branch. The working of the engine rarely ceases so long as the vessel is at the front, during an engagement the whole of the men are kept constantly at work in the engine-room, without relief or shiftings of the watch, and the temperature in the engine and boiler rooms is over 100° F.

The bodily temperature of the men rises to fever heat, pulses and breath-

ings are quickened, and even a veteran who is accustomed to this kind of work will suffer from parching thirst, loss of appetite, etc. A recruit will sometimes fall in a dead faint. When the ship is at anchor the work becomes a little lighter, and yet what with keeping the engine in good repair, the work of coaling, etc., etc., they are still so busy that they have little time for rest. With the crews of destroyers and torpedo boats, there is the additional trouble that, living as they do, within narrow confines of their vessels, they have to discharge their heavy duties, with very few men, in severe cold or intense heat, often fighting against violent winds and angry waves, and not infrequently beset with dangers even greater than the assaults of the enemy. Especially heavy became the duty imposed on destroyers after the blockade of the Liao-tung peninsula towards the end of May, 1904. In the executive branch a most careful and systematic lookout is kept by "watch and watch" every night; in the engineer branch, the men were divided into two to three watches, which remained on duty in turns for periods of from two to three nights and days.

On their return to the base, coaling and repairs make them breathlessly busy, and they are always kept on the alert so that they may obey any command that may come at a moment's notice. The crews had, therefore, but little time for rest, and their work was certainly excessive. After the beginning of 1905 their work was not so brisk as it was before Port Arthur, but even so it was at times quite double what it is in times of peace. This was especially the case with the men of the engineer branch. Working as they did in temperatures as high as from 100° to 140° F., the hardships they bore deserve our deepest sympathy.

Sleep was of course irregular and insufficient. The command to "man and arm ship" was given every night, and there were other duties. The hammocks were not used, they were employed as mantlets against the enemy's shells, and if slung as in ordinary time, would have obstructed the work of the men. Most of the men lay down on blankets spread on deck. After the battle of the Japan Sea, however, many of them began again to use their hammocks as usual. Picket duty at night was discharged by two, three or four watches, according as each ship thought fit, and as the situation of affairs demanded. Irregularity

and insufficiency of sleep was a necessary condition more or less observable in all ships, and even in broad day light siestas were tacitly permitted in many of the ships, so long as they did not interfere with the discharge of duty. The chief medical officer of the *Asahi* made an inquiry into the number of hours possible for sleep for men working by four watches. Here is his statement as to general conditions.

“The watches on shipboard are generally kept by dividing the crew into 4 parts, a watch in most cases lasting ten hours from 8 p.m. till 6 the next morning, and each part being relieved after two hours’ watch on deck. Thus, of the four watches the 2nd, 3rd and 4th parts are on duty but once and their hours of sleep are eight; but the first section is obliged to have a second spell of duty and the hours of sleep for them are only six. But further, more or less time is necessarily spent in changing watch and in eating, etc. As I wanted to know the number of hours actually allotted to sleep as precisely as possible, I made a number of men in a certain division take a record of hours from the time of going to bed to the time of rising, and tabulated the statements as below :

	Number of Men.	Number of Days of Inquiry.	Hours of Sleep for One Man Every Night.		
			hrs.	min.	sec.
Four watches	51	8	6	43	29
Watch and watch, and four watches	51	2	6	0	15

N.B. Watch and watch from 12 p.m., March 26, till 6 next morning, and four watches for all other times as usual.

“From the above table we see that the crew divided into four watches had an average of over 6 hours 43 minutes for sleep for one night. This may be sufficient for young men in full vigour. But when posted on watch and watch the average hours of sleep being only 5, I believe, it is necessary to give tacit permission to sleep in day time next day, so far as it does not interfere with their work, in order to restore their physical vigour.”

The report from chief medical officer of *Chihaya* says :

“ For the three months from May to July, 1905, the crew at night was divided into two watches 4 times, into 4 watches 17 times, into 8 watches 57 times, and 16 times the watch was kept by the guards alone. The hours of sleep were the same as in peace times in the last case ; but 5 hours with two watches, and 6 to 7 with four watches, while with eight watches, the hours of sleep being about the same as that by four watches, they kept watch every alternate day.”

The above is a general statement of the case as regards the hours of sleep obtained at night. It must be borne in mind, however, that on account of the heat and cold in summer and winter every one's sleep was frequently broken. This, of course, differed much according to the nature of the operations engaged in and the size and construction of the ships. But so long as the ships were facing the enemy, there were none that did not suffer in the amount of their rest.

Bath-taking not only gives refreshment to the fatigued, but is necessary as a preventive against various disorders ; The number of times it is taken differs with different ships according to the kind of operation the ships are told off to, the manner of getting water supply and the construction of the ships. In general, men of the engineer branch take a bath after their watch, while those of the executive branch are allowed to do so whenever convenient. On larger ships bath tubs are provided in abundance, but on smaller vessels there are none, and it is the usual practice to set up canvas tubs on the upper deck for the time needed ; at other times they utilized the bathroom for the engineer branch. The crews of destroyers and torpedo boats were able to take baths only by getting aboard the torpedo dépôt ships, transport vessels, etc.

It is no easy matter to arrange for all the men at the front to take baths frequently. In consideration, however, of its evident importance as attested in the war of 1894-5, the medical officers of all our ships endeavoured to put hot bath into practice as much as possible. On all ships, in addition to the general bath-taking allowed from time to time, those who had been occupied in work, such as coaling, which makes their body dirty and unclean, or who had laboured against the hard weather, were almost always allowed to take a warm bath. In summer the skin is more liable to get soiled and thence more prone

to skin diseases, so that bath-taking is more important then even than in winter. So it was allowed as often as circumstances would permit, and none of our ships experienced any failure of supply as far as bath-taking was concerned—the most frequent being once or twice a week and the least so was not less than two or three times per month.

Sea-water was used for bathing in most cases, fresh water being taken only for washing the body afterwards. Swimming and washing in cold water were allowed at proper times in summer; and while in tropical regions some of our ships allowed their men to take shower baths whenever it rained.

How to keep up the morale of man and how to give them spiritual consolation were the points that always engaged our attention. It is true that every one of us was ready at all times to lay down his life for his country; but living a monotonous life as we did, for many a long day, pent and cramped within the narrow confines of a ship, it was simply natural that our spirits should be lowered and relaxed. We endeavoured, therefore, to stimulate our men by the rehearsal of our Imperial Rescript from time to time, or by telling them stories of our loyal and brave, gallant and heroic, dead. Also so far as it did not interfere with the discharge of their duty, fencing, wrestling, *jūjutsu*, shooting, the singing of war-songs, recitations, etc., were permitted as recreation for mind and body. Sometimes prizes were offered to those who would play best.

The following amusements were special favourites among the men:—

Wrestling matches on land, combined regattas, shooting with aiming tubes and the eye-measurement of distances. Other sports and pastimes permitted were games of *go* and *shogi* (Japanese checkers and chess), quoits, sword dancing, graphophone and magic lantern shows, concerts, angling, etc., etc.

On high days and holidays they often had a merry time of it, laughing and jumping for pleasure, and playing at the above games and pastimes.

Our canteens gave the men no little comfort. After toiling all day as they did at their respective duties, a drop of good drink and a bit of sweet fruit was enough to refresh their weary souls and to clear away the agony of their hearts. Letters, too, from their friends and relations at home were a great source of comfort to the man at the front. They always greeted the sight of mail ships coming in

with dances of joy. Newspapers and magazines which told of the enthusiasm of the good folks at home, of their liberal contributions of food and drink, or of articles of daily use, etc., were ever causes of excitement and emotion among our men.

Above all, the Gifts in word and in kind which came from Their Majesties, the Crown Prince, and the Crown Princess with the frequent arrivals of Imperial messengers had a marvellous effect in exciting deep emotion in all our hearts.

Thus our men were always kept up in high spirits.

SECTION VII. PREVENTIVE MEASURES AGAINST CONTAGIOUS DISEASES.

The prevalence of infectious diseases in the midst of war is a most dreadful thing. The horrors of such a scene have been but too often witnessed in the history of war since olden times. In the late war of 1894-5, the precautions taken against such occurrences were by no means slack; but in certain parts of our front line cholera, dysentery, and abdominal typhus began to prevail and gave us a bitter experience. In the present war, our medical officers had their eyes open to this danger from the very beginning and did their best to maintain the health of our ships as far as circumstances would permit, by strict attention to cleaning, airing, ventilation, etc., and a never relaxing vigilance in the selection of food and drinks. At the beginning of the war, smallpox was prevalent in Vladivostok, and among those that returned home to Moji from that port three cases occurred. In Korea the same disease constantly prevailed, and the Medical Department of our Imperial Headquarters consequently issued an instruction dated February 16 on the enforcement of vaccination. On March 7 the same authority showed the course to be taken with regard to prophylactic inoculation for the prevention of contagious diseases. In the interval between April and May, cases of acute gastro-intestinal catarrh suddenly occurred in large numbers in many of our ships. All the medical officers of the ships made investigations into the cause thereof; and most of them came to the conclusion that the sickness was due to food. Thereupon an instruction was issued by the Commander-in-Chief of the Combined Squadron on June 6, and thereafter closer attention was to be given to provisions. Then it happened that, on June 26, one of the divers

on board the transport *Tsurugisan Maru* was seized with symptoms like those of cholera and died during the voyage. The corpse was buried at sea, and on the 27th when the ship arrived at the base, a command was given from the flag-ship *Yakumo* for her to be isolated and disinfected. The ship *Taichu Maru* took charge of the process. Fortunately no similar cases occurred. After an isolation for a certain number of days the infected ship was released and resumed her duty.

After this occurrence, preventive measures against contagious diseases became a pressing necessity; and on July 10 a quarantine commission was appointed at our naval base of Li-chang-shan-lich-tao. The ship *Taichu Maru* was mainly entrusted with the duty, and the officers of the commission were as under:—

Chief of the Quarantine Commission :—Captain N. Matsumura, Captain of *Taichu Maru*.

Quarantine Commissioners :

Surgeon M. Hirano, chief medical officer of *Taichu Maru*.

Paymaster K. Shimidzu, of *Taichu Maru*.

Assistant Surgeon I. Isoye, of *Shikishima*.

Assistant Surgeon G. Hosoya, of *Asama*.

Sub-lieutenant S. Asaka, of *Taichu Maru*.

Chief Warrant Officer J. Katashima, of *Taichu Maru*.

The Commander-in-Chief of the Combined Squadron commanded Captain Matsumura to build a quarantine station and an isolation barracks at Ha-sien-tao with the material intended for signal stations which he had on board his ship; and the medical attaché to the squadron, informed the chief medical officer of the Sasebo Naval Station that an order should be given to transport vessels running between home and the base to put up a yellow flag on the mast-head immediately on the occurrence of a contagious disease whether at sea or in port, and that such vessels should stay near the entrance to the harbour at the base while their medical officer (or if no medical officer were carried, then some proper member of the ship) come over to the flag-ship to make the report; and that until permission was obtained, no communication should be opened with other ships or stations under any pretence whatever.

It was about the 9th of August that dysentery and abdominal typhus gave signs of prevalence. Thereupon the Commander-in-Chief of the Combined Squadron cautioned all under his command by means of a notification and an instruction dated respectively the 19th and 26th of September, and with a view to preventing the introduction of the diseases from home, sent to the Commander-in-Chief of the Sasebo Naval Station the following telegram (Sept. 27.):—

“Cases of dysentery and abdominal typhus occurred in some ships of the fleet. There are signs of spreading. Their source seems to lie partly in Dalny and partly on the transport vessels, etc., coming from home, your strict attention is hereby requested. It is particularly to be desired that all fruit brought over by canteen trades-people should be absolutely prohibited.”

The Chief of the Staff of the Combined Squadron, Vice-Admiral Shimamura despatched to Captain Sakamoto, commanding the Dalny Defence Corps, the following communication:—

“Dysentery and abdominal typhus occurring on some of our ships are giving signs of spreading. The source from which they come seems to be chiefly from Dalny: it is hereby desired that as soon as your office is opened (it was actually opened on October 1), strict control be exercised and proper measures be taken to prevent the introduction of the diseases into our fleet, also that strict cautions should be given as to the disposal of fresh provisions taken from Chinese junks.”

Later on, Sudzuki, Chief Medical Officer of the Combined Squadron, seeing that dysentery and abdominal typhus always occurred in the 1st, 3rd and 6th divisions of our fleet—the divisions constantly engaged on patrol and guard duties,—supposed that it was due to the fact that coal vessels come alongside of our ships at the time of coaling, that Chinese junks were often visited for inspection, and that our torpedo boats often come from Dalny to deliver messages, possibly, also, that swarms of flies had been wafted out from the shore and had thus helped to spread the virus of the diseases. He, therefore, gave instructions to all the ships that flies should be destroyed; and at the same time telegraphed to the Chief of the Medical Department in the Imperial Headquarters expressing his desire that bird-lime should be supplied to our ships, whereby the same came to be supplied to all of our ships from the Sasebo Naval Store Dépôt. The dysentery and typhoid

fever had not become entirely extinct on our ships as late as October, so that on the 11th of the same month a restriction was put on the passengers on transport vessels, and on the 28th a new notification was issued for the enforcement of preventive measures against infectious diseases.

After Port Arthur fell at the beginning of January, 1905, a large part of our fleet at the front went home for repairs. Instructions and lectures were frequently given on the subject of the care to be taken by our men when at home, and at the same time the sanitary condition of the locality was minutely inquired into with a view to effective prevention against infectious diseases. Endeavours were also made in the selection and inspection of food and drink for the enforcement of sanitation in the ships.

At a later date, when the main force of our fleet started once more on an expedition towards the Korean Strait, Commander-in-Chief Admiral Togo issued a notification dated February 4, as follows:—

“Scarlatina has been prevalent about Seoul since last year, and a few cases of smallpox occur here and there all over Korea. So that the utmost caution is necessary. It is thought advisable to have all newly hired servants vaccinated immediately.”

The weather was then beginning to grow milder, and the time for a great engagement on the sea was fast drawing on. The strictest caution was necessary for the health of our men. At such a time our ships and vessels lying in Chin-lai Bay being so great in number were often in want of fresh provisions, for they had to rely solely upon the supplies that could be obtained from Song-sin, and our supply vessels. Under this circumstance it was found necessary for some of our ships to buy fresh fish from the Korean boats plying about. This was prohibited on April 2 by an order from the Combined Squadron, as follows:

“The Korean boats plying about are full of blue bottle-flies, which are fearful agents for propagating infectious diseases. Such unclean boats shall hereafter not be allowed to come alongside of our ships.”

In the middle of May when measles occurred in our ship *Asama*, Admiral Togo called the attention of all under his command with the issue of an order dated 19th, as below:—

“Yesterday (the 18th) measles occurred on the *Asama*, and gradually spreading has already produced 20 cases, inclusive of an officer and a midshipman. At this crisis, it behoves you to take the utmost care of your health, so that our fighting force may not be reduced by the large number of invalids. As soon as cases are discovered, take precaution to send them immediately to a hospital ship that others may not be infected.”

Besides all this, whenever contagious diseases occurred near our naval base, or in other places called at, communication with the locality was always cut off and the strictest supervision made over the provisions and drinking water to be taken in, as also over the men going ashore, in such a way as to prevent the intrusion of the virus. So far (see also Sect. I.) for the preventive measures taken against contagious diseases. When a contagious disease occurs on our ships and vessels, disposition is made against infection as a matter of course in accordance with the provisions in the Regulations relating to the Discharge of Duties by Medical Officers of the Navy; but in the case of the occurrence of any diseases on special service ships carrying no medical officer, the case is treated by the medical officer from one of the ships near by, according to the order from the Chief of the Naval Medical Department at the Imperial Headquarters, dated February 24, 1904. Should the case be found to be an infectious one, it is, also, to be disposed of according to the above Regulations. That is to say, when cases of contagious disease occur in our ships or vessels, the patient is at once sent to a Naval Hospital, or a Naval Hospital Ship. Or he may be confined to a civil hospital, and where no such hospital is accessible, the patient is to be isolated as perfectly as possible within the ship and to be sent home at the first opportunity.

The place and articles suspected of being infected are to be thoroughly disinfected, and where necessary all persons that came in contact with the patient are to be isolated also. Furthermore the ship on board of which a large number or continuous succession of such cases occur simultaneously, and which may therefore be suspected of being herself infected, is to be sent home to a quarantine station at a Naval Port or some other sea-port for a general disinfection. It will be seen from this that the greatest precautions were taken against infectious diseases, and that a thorough disinfection was enforced and yet the occurrence of a few

cases was inevitable. Thus, in the period of the war from February 6, 1904, to October 15, 1905, the contagious diseases that occurred in the force afloat and ashore together with the civil employes were measles, abdominal typhus, dysentery, mumps, cerebro-spinal meningitis, and malarial fever. The number of cases of the above diseases at the front was 1,364 and that at home 690, together making 2,054.

The following is a table showing the number of cases arranged according to the diseases and the months of their occurrence :—

**CASES OF INFECTIOUS DISEASES AMONG ENLISTED MEN AND
CIVILIAN EMPLOYÉS OF THE NAVY, CLASSIFIED AC-
CORDING TO THE MONTHS OF OCCURRENCE.**

(Feb. 6, 1904—Oct. 15, 1905.)

Diseases. \ Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Measles.....	—	1	1	2	38	7	2	—	—	1	—	—	52
Typhoid Fever	75	38	25	31	13	18	39	33	77	54	25	17	445
Dysentery	1	1	2	3	11	11	17	27	93	52	10	6	234
Malaria	3	5	11	13	17	45	62	70	45	22	8	10	311
Influenza	294	110	73	54	138	74	24	4	26	129	2	42	970
Mumps.....	—	10	11	1	2	1	1	2	1	—	—	1	30
Cerebro-spinal Fever.....	—	1	1	—	—	—	8	1	—	1	—	—	12
Grand Total	373	166	124	104	219	156	153	137	242	259	45	76	2,054

CASES OF INFECTIOUS DISEASES AMONG ENLISTED MEN AND CIVILIAN EMPLOYÉS AT THE FRONT AND AT HOME.

(Feb. 6, 1904—Oct. 15, 1905.)

Disease.			1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	32
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Disease.			Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Grand Total.	
Force Afloat and Ashore at Home.	Force Afloat.	Dysentery.	1904 1905	— —	— —	— —	— —	— —	— —	— 2	— —	— 1	2 —	— —	1 —	4 2	6	
		Malarial Fever.	1904 1905	— —	1 —	— —	2 —	4 —	2 —	2 —	5 —	2 —	1 —	1 —	1 —	21 —	21	
		Influenza.	1904 1905	— —	2 —	— —	1 20	— —	1 3	2 2	— —	— —	— —	1 —	3 —	10 25	35	
		Mumps.	1904 1905	— —	— —	— —	— —	1 —	— —	— —	— —	1 —	— —	— —	— —	2 —	2	
		Cerebro-spinal Meningitis.	1904 1905	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	—	
		Total.	1904 1905	— 1	3 1	1 —	3 20	5 12	3 3	4 4	5 1	4 2	3 2	3 —	8 —	42 46	88	
		Grand Total.	1904& 1905.	1	4	1	13	17	6	8	6	6	5	3	8	88	—	
	Force Ashore.	Measles.	1904 1905	— —	— —	— —	— —	1 2	— —	— 2	— —	— —	— —	1 —	— —	— —	1 5	6
		Typhoid Fever.	1904 1905	— 55	— 13	— 5	2 5	— 2	7 1	7 6	13 3	4 11	7 3	13 —	2 —	55 104	159	
		Dysentery.	1904 1905	— —	— —	— 1	— 2	1 7	— 5	— 4	— 6	1 9	1 4	3 —	2 —	8 38	46	
		Malarial Fever.	1904 1905	— 2	1 1	4 3	— 4	6 2	15 10	19 14	15 10	17 5	7 4	6 —	7 —	97 55	152	
		Influenza.	1904 1905	— 19	— 50	— 8	3 2	2 7	2 4	— 3	1 —	— 2	124 —	— —	1 —	133 95	228	
		Mumps.	1904 1905	— —	— —	— —	— —	— —	— —	— 1	— —	— —	— —	— —	— —	— 1	1	
		Cerebro-spinal Meningitis.	1904 1905	— —	— —	— 1	— —	— —	— —	— 8	— —	— —	— 1	— —	— —	— 10	10	
		Total.	1904 1905	— 76	1 64	4 18	5 13	10 20	24 20	26 38	29 19	22 27	139 13	22 —	12 —	294 308	602	
		Grand Total.	1904& 1905.	76	65	22	18	30	44	64	48	49	152	22	12	602	—	
General Total.				77	69	23	41	47	50	72	54	55	157	25	20	—	690	

With regard to each of the above-named diseases we shall now present summarized statements.

Measles occurred rather numerously on the *Asama* and *Katsuragi* in the two months of May and June, 1905, but sporadically on other ships: e. g. 1 case each in the torpedo boats belonging to the torpedo depôt ships *Nisshin Maru* and *Kusuga Maru* in April, 1904, and another case in the Maizuru Naval Barracks in May, making altogether 3 cases. In 1905, however, a rather larger number occurred, totalling 49 cases. After the first occurrence of 1 case on the

Murasame in February, 1905, another case occurred on the *Chiyoda* in March; and in May the number suddenly increased to 27 cases on the *Asama* at Chin-hai Bay, 1 case on the *Tokiwa*, 11 on the *Katsuragi* while at the anchor at Nagasaki, and 2 in the Sasebo Port Office, making altogether 37 cases. After the occurrence of 7 cases on the *Asama* in June, the disease almost disappeared, excepting 2 cases in the Sasebo Naval Barracks in July and 1 case in the Torpedo Division at Ominato.

The sources of infection were in most cases obscure. From the investigation made on the *Asama* where the largest number of cases occurred, it was supposed that the virus was imported thither through the medium of food and drink, or else by men who had newly come aboard from Kure having passed through Sasebo by land.

The chief surgeon of the *Katsuragi* reports that one of her men contracted the disease at a boarding house at Nagasaki, and through him the disease spread in the ship. In other ships, too, it was supposed in most cases that source of infection must have been somewhere in Japan.

Abdominal typhus occurred mostly in the latter half of 1904 and at the beginning of 1905. In short, each period in the present war saw more or less of this sickness every month, and the total number of cases reached to 445. In some cases the occurrences were almost numerous enough and regular enough for the disease to be treated as epidemic, but as a rule, whether at home or abroad, it could only be looked upon as sporadic. Thus, of the shore stations, the 78 cases at the Sasebo Naval Barracks head the list, followed by 29 cases at the Yokosuka Naval Barracks, 18 at the Maizuru Naval Barracks, 13 at the Chin-hai Defence Corps and 10 in the Naval Brigade. In all other places the number was 5 or below; 5 cases each in Yokosuka and Sasebo Torpedo Divisions and 3 cases each in Port Arthur and Yokosuka Port Offices and Takeshiki Secondary Naval Station, and 2 cases each in Dalny Defence Corps, the Gunnery School, the Artificer's School, Torpedo School, Kure Naval Barracks, Kure Port Office, Sasebo Port Office and Sasebo Navy Yard; and 1 case each in the Submarine Mining Corps attached to the fleet, the Defence Corps belonging to the fleet, Yokosuka Naval Hospital, Kure Reserve Ships Office, Kure Torpedo Divi-

sion, and Bako Secondary Naval Station. The largest numbers among the ships and vessels of the fleet were 37 on the *Yobu*, followed by 14 on the *Taichu Maru* (inclusive of 2 cases that occurred in the converted gunboat), 13 on the *Asahi*, 12 on the *Shikishima* and *Kongo*, 10 on the *Mishima*, 9 on the *Yakumo*, 7 on the *Tokiwa*, 6 on the *Kasuga*. All the rest were numerically few:—as 5 each on the *Takachiho* and the flotillas attached to the *Nikko Maru*, 4 each on the *Mikasa*, *Yashima*, *Fuso*, *Idzumo*, *Iwate*, *Hashidate*, *Akitsushima*, 3 each on the *Chinyen*, *Asama*, *Takasago*, *Chiyoda*, *Nissin*, *Kasagi*, *Otowa*, *Akagi*, *Ikadzuchi*, the flotillas belonging to the *Kumano Maru*, *Miike Maru* and *Keijo Maru*, 2 each on the *Fuji*, *Iki*, *Itsukushima*, *Matsushima*, *Idzumi*, *Chihaya*, *Amagi*, *Kasumi*, *Asagiri*, *Fubuki*, the flotillas attached to the *Kasuga Maru*, *Nippon Maru*, *Kasuga Maru*, *Nikko Maru* and *Daijin Maru*, and 1 case each on the *Adzuma*, *Chitose*, *Yoshino*, *Naniwa*, *Nitaka*, *Tsushima*, *Suma*, *Saiyen*, *Tatsuta*, *Ihiei*, *Tsukushi*, *Maya*, *Chokai*, *Banjo*, *Tenryu*, *Murasame*, *Inadzuma*, *Murakumo*, *Kagero*, *Kanto Maru*, *Kumano Maru*, *Taichu Maru*, *America Maru*, *Heijo Maru*, *Bingo Maru*, *Matsuyae Maru*, *Karasaki Maru* and *Anegawa Maru*.

Dysentery occurred mostly in the season extending over August, September, and October in both the years 1904 and 1905. Thus after the first occurrence of a case in the Torpedo Division at Yokosuka in May, 1904, the number of cases gradually increased until in the two months of September and October it rose to the highest number of 45 to 71. After November the number began to decrease to below 10, the total for the year being 151 cases. In the year 1905 the numbers were generally small, the total being only 83. From January to April not more than 1 to 3 cases appeared in each month. After May, however, the number gradually increased and rose to 10 or thereabout, while in the two months of August and September it rose to the highest number of 18 to 22; but in October it went down to 7. The localities of occurrence were mostly among the force afloat and ashore at the front, while among those at home, with the exception of 19 cases in the Bako Secondary Naval Station and 7 cases in the Sasebo Naval Barracks, only 2 or 3 cases occurred. Thus, 3 cases each on the *Kongo*, Nagasaki Submarine Mining Corps, and Takeshiki Secondary Naval Station; 2 cases each—*Aso*, Kure Naval

Barracks, Kure Naval Hospital, Kure Torpedo Division, and Sasebo Port Office ; and 1 case each—*Tenryu*, Yokosuka Naval Barracks, Yokosuka Port Office, Yokosuka Torpedo Division, the Artificer's school, Naval College, and Keelung Submarine Mining Corps, making in all 52 cases. Among the force at the front beginning with the first occurrence of 4 cases in the Chin-hai Defence Corps in June, 1904, there appeared 182 cases during the period ending October, 1905. The largest figure 22 for the Chin-hai Defence Corps, followed by 13 each for the *Yushima* and *Takasago*, 12 for the *Taichu Maru*, 11 for the *Asahi*, 9 for Dalny Defence Corps, 7 for the *Chinyen* and *Chitose*, and 6 for the *Tainan Maru*. All others were 5 or below,—5 each for the *Tokiwa* and *Saiyen*, 4 each for the *Kasagi*, *Nisshin*, *Suna*, the torpedo boat flotillas attached to the *Nikko Maru*, Naval Heavy Gun Brigade, and at the Shore-Stations at Port Arthur ; 3 each for the *Fuji*, *Iwate*, *Saikio Maru* and Gensan Defence Corps ; 2 each for the *Mikasa*, *Fuso*, *Asama*, *Idzumo*, *Matsushima*, *Shinonome*, *Ikadzuchi*, *Nikko Maru*, *Kumano Maru* and the flotilla attached thereto ; and 1 each for the *Yakumo*, *Kasuga*, *Otowa*, *Maya*, *Inadzuma*, *Yugiri*, *Shiranui*, *Usugumo*, *Akebono*, *Kasuga Maru*, *Kobe Maru*, Port Arthur torpedo boat flotilla, Submarine Mining Corps attached to the Squadron, Naval Port Office at Port Arthur and Port Arthur Navy Yard.

Whenever a contagious disease occurred in ships of the fleet or at a shore station it was customary to make research into the sources of contagion ; but these in most cases remained obscure. With the exception of a few rare cases such researches led to no better conclusion than mere conjecture. If this is the case in ordinary times of peace, how much more difficult must it be to trace up the exact route by which abdominal typhus and dysentery travelled before making their appearance in the midst of the confusion and bustle of war.

In the present war, the cases in which a conclusion was arrived at respecting sources of the disease were briefly as follows :—

Abdominal typhus occurred rather extensively among the force ashore, as, for instance, in the Naval Barracks at Yokosuka, Sasebo, Maidzuru, and the Chin-hai Defence Corps. At one time during the two months of January and February, 1905, it seemed to be almost epidemic at Sasebo ; in all the other

places it occurred in small number of cases and quite sporadically. The source of disease in the Naval Barracks at Naval Ports seems to lie in infected surroundings. Evidently the local sanitary conditions exercise a direct influence upon the health of the men in the Navy, and the strictest attention had always to be paid to this point. This was more especially the case during this time of war, when the town suddenly got crowded to the extreme limit of its capacity—when the traffic of goods was brisk and animated, bringing together immense crowds of coolies and labourers who came flocking in from all quarters. All these circumstances helped greatly to augment the chances of spreading infectious diseases. What was more, the plan of the town was as yet in an incomplete state of development, and sanitary establishments, such as water works and drainage, were rudimentary and imperfect; so that the utmost that could be devised by the skill of man for protection against infection fell far short both in ideal and in results. A certain amount of restriction was now placed on the leave of our men, and communication between them and the outside world prohibited. But it was found impossible entirely to cut off all communications. There was the constant need of obtaining supplies and provisions, and in places like a Naval Barracks especially there is a constant coming and going, of fresh recruits, of men drafted and exchanged, to say nothing of the occasions which must arise wherever a large number of men live together. All this opens many doors for the entrance of the disease. It will not be difficult further to infer that though it is impossible accurately to trace the entrance of the disease into our Naval Establishments on land, yet the source must lie in somebody who has introduced into the establishments the diseases with which he had himself been infected either in the town or some other place. Still, there were some rare exceptions in which the disease was traced to some source in the establishment itself; as for instance the occurrence in the Chin-hai Defence Corps in December, 1904, when suspicion pointed to the drinking water, and the result of minute researches proved the existence of the typhoid bacilli in the water within an iron pipe, which conducted the water from the distilling plant into the cistern. After a thorough disinfection the disease disappeared. As to ships and vessels a rather large number of cases occurred on the *Yobu* and *Mishima*; but the disease never became prevalent. The sources

are obscure in most cases, but there were many cases in which it seemed evident that the infection had come from somewhere on land, such as Korea and the coast of Liao-tung—especially near Dalny and Siao-ping-tao. Ships that had no direct intercourse with such localities and yet had the disease introduced, most probably got it through the medium of goods taken in or the swarms of flies from the transport vessels, or from Chinese junks with which they came in contact for the purchase of supplementary supplies of fresh provisions. There were also many places on the coast of Japan, where it was thought likely that our men might have got infected, such as Takeshiki, Sasebo, Nagasaki, Kure, Osaka, Uraga, Yokosuka, Yokohama, Hakodate, etc.

Dysentery, like typhoid fever, is for the most part obscure as to its source of infection; but the places thought most likely to have been the sources of origination were Port Arthur, Dalny, Siao-ping-tao or the Chin-hai Defence Corps. Or, the infection might have come through flies or food brought from such places. Only in very rare cases was it thought to have been contracted on land at home, as at the time there did exist a few cases of the disease in Bako and Sasebo.

Cases of malarial fever were comparatively numerous, and totalled 311. They occurred mostly in the two months of July and August in the years, 1904 and 1905, and the two months before and after the above two months come next in the number of cases occurring. The places of occurrence were mostly on land, both at the front and at home, and the disease was comparatively rare on ships—and especially so with the ships at the front, where the largest number that occurred never exceeded 5 or 6 cases. The Shore Establishments in which more than 10 cases occurred were Maizuru Naval Barracks, 71 cases, Chin-hai Defence Corps, 37 cases, Yokosuka Naval Barracks, 16 cases, and Sasebo Naval Barracks, 10 cases. There were, besides, 9 cases in the Naval College, 7 in the Kure Naval Barracks, 6 in the Yokosuka Torpedo Division, 5 in the Gen-san Defence Corps; 4 each in the Defence Corps attached to the fleet (inclusive of Submarine Mining Corps), the Naval Heavy Gun Brigade, Takeshiki Secondary Naval Station, Torpedo School, and Kure Torpedo Division; 3 each in the Keelung Submarine Mining Corps and the Naval Engineering College, 2 each in Port Arthur Submarine Mining Corps, Bako Secondary Naval Station, and Kure

Port Office; and 1 each in the Phal-ku-pho Defence Corps, Dairen Defence Corps, Port Arthur Port Office, the Gunnery School, the Artificers' School, Yokosuka Port Office, Kure Naval Hospital, Sasebo Torpedo Division, Sasebo Port Office, Ominato Torpedo Division, Maizuru Torpedo Division, Sasebo Naval Prison, Maizuru Naval Prison and Maizuru Naval Hospital. Of the ships of the fleet, 14 cases on the *Hiyei* was the largest in number; 9 cases on the *Kongo* and 6 on the *Adzuma* came next; while all the rest were five or below 5; as 5 cases each on the *Takachiho* and *Taichu Maru*; 4 cases each on the *Hashidate* and *Yayeyama*; 3 cases each on the *Mikasa*, *Nisshin*, *Mishima*, *Chitose* and the torpedo boat flotillas belonging to the *Kumano Maru*; 2 cases each on the *Asama*, *Idzumo*, *Yakumo*, *Matsushima*, *Akitsushima*, *Kasuga*, *Otowa*, *Nitaka*, *Musashi*, *Chihaya*, *Asagiri*, *Kasuga Maru*, *Nikko Maru* and *Takao*; and 1 case each on the *Iki*, *Shikishima*, *Tokiwa*, *Tsushima*, *Yobu*, *Banjo*, *Uji*, *Kasugi*, *Itsukushima*, *Usugumo*, *Murakumo*, *Tainan Maru*, *America Maru* and *Yamato*.

Of all contagious diseases, influenza produced the largest number of cases, the patients having reached a total of 970. Of these, 313 cases occurred in 1904, being most numerous in October, followed in the order of frequency by May, December, April, and September. Of the 129 cases that occurred in October, there were 121 cases in the Sasebo Naval Barracks, 3 cases each in Bako Secondary Naval Station and on the *Kasuga*, and 2 cases on the *Hashidate*. The 65 cases that occurred in May include 60 cases on the *Idzumo*, 2 on the *Akitsushima* and 1 case each on the torpedo boat flotilla belonging to the *Kumano Maru*, in Sasebo Naval Hospital, and Sasebo Naval Prison. The 42 cases that occurred in December comprise 33 cases on the *Mikasa*, 5 cases on the *Tainan Maru*, 3 cases on the *Takao*, and 1 case at the Sasebo Naval Port Office. The 29 cases that occurred in April were 20 cases on the *Chihaya*, 3 cases in the Sasebo Torpedo Division, 2 cases on the *Akitsushima*, and 1 case each on the *Asahi*, *Hashidate*, *Takao* and *Murakumo*. The 23 cases that occurred in September include 13 cases on the *Kasuga*, and 10 cases on the *Hashidate*. All the other months had less than 10 cases apiece. The year 1905 had more than double the number of cases, the total being 656 as against 313 of the year before. The epidemic reached its maximum in January, February, and March. April, May, June, and July came next, and after August the disease disappeared. In January there

were 249 cases, of which 60 occurred on the *Chiyoda*, 47 on the *Itsukushima*, 30 on the *Akitsuushima*, 29 on the *Kongo*, 22 on the *Asama*, 21 on the *Niitaka*, 16 on the *Hashidate*, 12 on the *Fuji*; 8 each on the *Tainan Maru* and in Sasebo Naval Barracks; 7 each on *Naniwa*, *Oboro* and *Shinonome*, 6 on the Sasebo Torpedo Division; 3 in the Sasebo Port Office; 2 each on the *Nisshin* and Yokosuka Torpedo Division; and 1 each on the *Mikasa*, *Ikadzuchi*, *Murakumo*, *Daigi Maru*, *Kumano Maru*, in Port Arthur Torpedo Division and the Shore Establishments at Port Arthur. The 107 cases that occurred in February were 30 cases in the Takeshiki Secondary Naval Station, 25 on the *Hashidate*, 17 on the *Niitaka*, 14 in the Sasebo Naval Barracks, 5 on the *Chihaya*; 2 each on the *Asahi*, *Itsukushima*, Sasebo Port Office, and Yokosuka Torpedo Division; and 1 case each on the *Fuji*, *Nisshin*, *Tsushima*, *Kongo*, *Musashi*, *Shinonome*, in the Yokosuka Naval Barracks and Nagasaki Submarine Mining Corps. In March 70 cases occurred, of which 54 occurred on the *Hashidate*, 4 on the *Tainan Maru*; 3 each in the Sasebo Port Office and Takeshiki Secondary Naval Station; and 1 case each on the *Naniwa*, *Daijin Maru*, *Taichu Maru* and the torpedo boat flotilla belonging to the *Nikko Maru*. In May 73 cases occurred, of which 63 occurred on the *Hiei*, 4 in the Yokosuka Torpedo Division, 2 in the Sasebo Naval Barracks; and 1 each on the *Fuso*, *Nisshin*, *Oboro* and at the Bako Secondary Naval Station. In June 67 cases occurred, of which 42 occurred on the *Chiyoda*, 18 on the *Fuso*; 3 each on the *Toyohashi*, and at the Yokosuka Torpedo Division; and 1 case in the Nagasaki Submarine Mining Corps. The 25 cases that occurred in April were 20 cases that occurred on the *Yamato*, 3 cases on the *Tainan Maru*, and 1 case each in Sasebo Naval Barracks and Yokosuka Torpedo Division. The 15 that occurred in July were 8 in Port Arthur Port Office, 2 on the *Tukao*, and 1 each on the *Murakumo*, *Kobe Maru*, in the Sasebo Naval Barracks, Yokosuka Torpedo Division and at the Bako Secondary Naval Station.

There were, besides, 2 cases that occurred in August in the Port Arthur Port Office, and 1 case in September in each of the Yokosuka Torpedo Division, the Naval College and Chin-hai Defence Corps. Thus we see that throughout the two years, 1904 and 1905, the greatest number of cases (150) occurred in the Sasebo Naval Barracks. Besides the 112 cases that occurred on the *Chiyoda* and 109

that occurred on the *Hashidate*, a pretty large number of cases (63) occurred on the *Iiyei*; 57 occurred on the *Idzumo*, 49 on the *Itsukushima*, 37 on the *Nitaka*, 34 on the *Mikasa*, 33 in the Takeshiki Secondary Naval Station, 27 on the *Aki-tsushima*, 26 on the *Chihaya*, 23 on the *Asama*, 21 on the *Yamato*, 20 on the *Tainan Maru*, etc.

Epidemic parotitis occurred rather largely in 1904, numbering 28 cases in all. The 16 cases that occurred on the *Fuso* during the months of February and March were the largest in number, the *Hashidate* produced 1 case each in the four months of February, March, August, and December, making 4 cases in all. There occurred, besides, 2 cases each on the *Miyako* and *Takao*; and 1 case each on the *Asama*, *Takasago*, *Naniwa*, and *Tatsuta*.

In the year 1905, the number was extremely small. Only 1 case occurred on the *Hashidate* in February, and another in the Kure Naval Prison in July, making altogether but 2. The sources of contagion are generally unknown. The report, as made by the *Fuso*, says, that as there was a patient with this disease in a consort-ship which was lying near by while she was at anchor at Takeshiki, the germ of the disease was most probably imported therefrom in some unknown way.

Cases of cerebro-spinal meningitis were very few,—only 12 in all. In February, 1905, 1 case occurred on the *Asahi*; in March another at the Nagasaki Submarine Mining Corps; in July 8 cases occurred in the Kure Naval Barracks; in August 1 case in Port Arthur Port Office; and in October 1 case in the Kure Naval Barracks. The year 1904 saw no occurrence at all.

The investigation made by the Kure Naval Barracks where the largest number of cases occurred, says:—

“Indeed there existed here and there a few cases of the same disease in the town of Kure at the time; but our patients being all recruits to whom shore-leave, e.g. for bath-taking, had never been granted and who had only been ashore for field exercise or long marches; so that they had no chances of contagion by touch. But, unaccustomed to naval life as they were at the time, they were subjected to severe drill out in the hot and burning sun, and became over-fatigued in mind and body. Thus a susceptibility for the disease having been created, they came to be infected through some unknown channel.”

In short, influenza prevailed to a considerable extent on the *Mikasa*, *Idzumo*, *Asama*, *Hashidate*, *Chiyoda*, *Akitsushima*, *Chihaya*, *Hiyei*, in the Naval Barracks at Sasebo and in the Secondary Naval Station at Takeshiki. In addition to the above, the following diseases seemed epidemic at one time, e.g. measles on the *Asama* and *Katsuragi*, abdominal typhus on the *Yobu*, *Mishima* and at Sasebo Naval Barracks, dysentery in the Chin-hai Defence Corps, mumps on the *Fuso* and cerebro-spinal fever in the Kure Naval Barracks. But none of these presented a pandemic appearance, nor were they severe in their type. Of all the patients 56 died of abdominal typhus, 11 of dysentery, and only one of cerebro-spinal meningitis. The influenza was especially mild in the course of the disease, the shorter case lasting but for a few days and the longest not more than a week or two for complete recovery. Of the 970 patients only one died of complication of cerebral meningitis. Besides the above, small pox and scarlet fever prevailed in some parts of Korea; but our ships at the front succeeded in defending themselves against these diseases during the whole period of the war.

Below we give a table showing contagious diseases that occurred amongst men outside of the Navy, such as workmen, coolies, sailors, boatmen, members of the Red Cross Relief Parties, etc., arranged according to their service afloat, ashore, at home and at the front.

Diseases.	Year.	Aboard Ships at the Front.		Ashore at the Front.		Aboard Ships at Home.		Ashore at Home.		Total.	
		Cases.	Ratio per 1,000 of Strength.	Cases.	Ratio per 1,000 of Strength.	Cases.	Ratio per 1,000 of Strength.	Cases.	Ratio per 1,000 of Strength.	Cases.	Ratio per 1,000 of Strength.
Typhoid Fever ...	1904	24	5.30	12	7.14	2	3.98	5	0.17	43	1.21
	1905	23	6.34	9	3.77	3	7.56	4	0.10	39	0.87
Dysentery	1904	13	2.87	23	13.68	2	3.98	4	0.14	42	1.18
	1905	3	0.83	25	10.48	2	5.04	7	0.18	37	0.83
Diphtheria	1904	—	—	—	—	—	—	—	—	—	—
	1905	1	0.28	—	—	—	—	—	—	1	0.02
Grand Total	1904	37	4.29	35	10.41	4	3.98	9	0.16	85	1.20
	1905	27	2.48	34	7.13	5	6.30	11	0.14	77	0.57

SECTION VIII. STATE OF HEALTH OF OUR MEN.

I. Body Weight.

The body weight of our men throughout the whole Navy during the war showed results rather better than those in time of peace. Thus, the measurements made of 31,585 men in March, 1904, and of 34,798 men in September, showed an average of 15 *kan* 662 *momme* per head. Compared with the 15 *kan* 505 *momme* of the preceding year the above is an increase by 157 *momme* and 402 *momme* increase over the average for the past 20 years, and stands highest of all the annual averages since 1884. When weighed in March, 1905, of the cadets and men numbering 34,064 and in September of 38,134 of the same, the average per head was 15 *kan* 637 *momme*, which is a decrease by 25 *momme* from that of the preceding year, but an increase by 358 *momme* over the general average for the past 21 years which is 15 *kan* 279 *momme*. Therefore, it stands highest of all the yearly averages excepting that of the preceding year only. The average body weight per head of the cadets and men in the whole Navy for the two years, 1904 and 1905, is 15 *kan* 649 *momme*, which being compared with that of the past 20 years is an increase by 389 *momme*, and stands at the head of all the annual averages from 1884 to 1903.

Now comparing the average body weight per head of men at the front with that on the ships and vessels in 1903 (time of peace), the average body weight per head taken from the total number of men, 21,144, weighed March, 1904, was 16 *kan* 34 *momme*, which being compared with the average body weight per head of the preceding year (time of peace) which was 15 *kan* 893 *momme*, shows an increase by 141 *momme*. In comparison with the average for the same period in the preceding year, an increase was shown by the following 57 ships, 7 flotillas, and a naval corps, viz. *Fuji*, *Yushima*, *Shikishima*, *Asahi*, *Hatsuse*, *Idzumo*, *Iwate*, *Asama*, *Tokiwa*, *Yakumo*, *Yoshino*, *Kasagi*, *Nanwa*, *Takachiho*, *Niitaka*, *Itsukushima*, *Hashidate*, *Suna*, *Chiyoda*, *Akitsushima*, *Idzumi*, *Chihaya*, *Fuso*, *Saiyen*, *Kaimon*, *Tsukushi*, *Heiyen*, *Banjo*, *Maya*, *Chokai*, *Uji*, *Atago*, *Kongo*, *Hiyei*, *Katsuragi*, *Toyohashi*, *Shimonome*, *Usugumo*, *Ikadzuchi*, *Ina-*

* *Kan*=8.28 pounds. † *Momme*=0.1325 ounces.

dzuma, *Akebono*, *Sazanami*, *Oboro*, *Shirakumo*, *Asashio*, *Murasame*, *Hayatori*, torpedo-boat flotillas Nos. 9, 10, 11, 14, 15, 16, 20, *Kobe Maru*, *Kasuga Maru*, *Nikko Maru*, *Taichu Maru*, *Hong Kong Maru*, *Yobu*, *Miike Maru*, *Nagato Maru*, and the Defence Corps at the temporary base; whilst a decrease was shown by the following 26 ships; viz. *Mikasa*, *Adzuma*, *Nisshin*, *Takasago*, *Chitose*, *Akashi*, *Miyako*, *Tatsuta*, *Chinyen*, *Tukao*, *Amagi*, *Akagi*, *Oshima*, *Akatsuki*, *Kasumi*, *Murakumo*, *Yugiri*, *Shiranui*, *Kagero*, *Asagiri*, *Saikio Maru*, *Kumano Maru*, *Genkai Maru*, *Daijin Maru*, *Yamashiro Maru* and *Chefoo Maru*.

The average body weight per head taken from the total number of 21,330 men weighed in September, 1904, was 15 *kan* 596 *momme*. This is an increase by 240 *momme* over the average for the same period in the preceding year (time of peace) which was 15 *kan* 356 *momme* per head. Compared with the same for the preceding year an increase was shown by the following 56 ships; viz., *Yashima*, *Asahi*, *Mikasa*, *Idzumo*, *Iwate*, *Tokiwa*, *Asama*, *Adzuma*, *Yakumo*, *Nisshin*, *Takasago*, *Chitose*, *Tukachiho*, *Nitaka*, *Tsushima*, *Itsukushima*, *Hashidate*, *Idzumi*, *Chiyoda*, *Akitsuishima*, *Akashi*, *Chihaya*, *Tatsuta*, *Fuso*, *Kongo*, *Saiyen*, *Tsukushi*, *Banjo*, *Oshima*, *Akagi*, *Maya*, *Chokai*, *Uji*, *Atago*, *Ikadzuchi*, *Inadzuma*, *Akebono*, *Sazanami*, *Oboro*, *Akatsuki*, *Kasumi*, *Murakumo*, *Yugiri*, *Shiranui*, *Kagero*, *Hayatori*, *Kobe Maru*, *Nikko Maru*, *Kumano Maru*, *Taichu Maru*, *Hong Kong Maru*, *Yobu*, *Genkai Maru*, *Daijin Maru*, *Yamashiro Maru* and *Chefoo Maru*; whereas a decrease was shown by the following 15 ships and one naval corps, viz., *Shikishima*, *Fuji*, *Kasagi*, *Naniwa*, *Suna*, *Chinyen*, *Shinonome*, *Usugumo*, *Shirakumo*, *Asashio*, *Murasame*, *Asagiri*, *Saikio Maru*, *Kasuga Maru*, *Miike Maru* and the Defence Corps at the temporary naval base. All other ships and vessels, being either missed in the report or having entered into service by purchase or charter after the opening of the war, have no average for the preceding year with which to make the comparison.

The total number of men weighed in March, 1905, being 22,665, the average body weight per head was 15 *kan* 983 *momme*, which is an increase by 90 *momme* over the average for the same period in 1903 (time of peace), which was 15 *kan* 893 *momme*. Taken severally the following 30 ships each showed an increase: *Shikishima*, *Asahi*, *Idzuma*, *Tokiwa*, *Yakumo*, *Adzuma*, *Kasuga*,

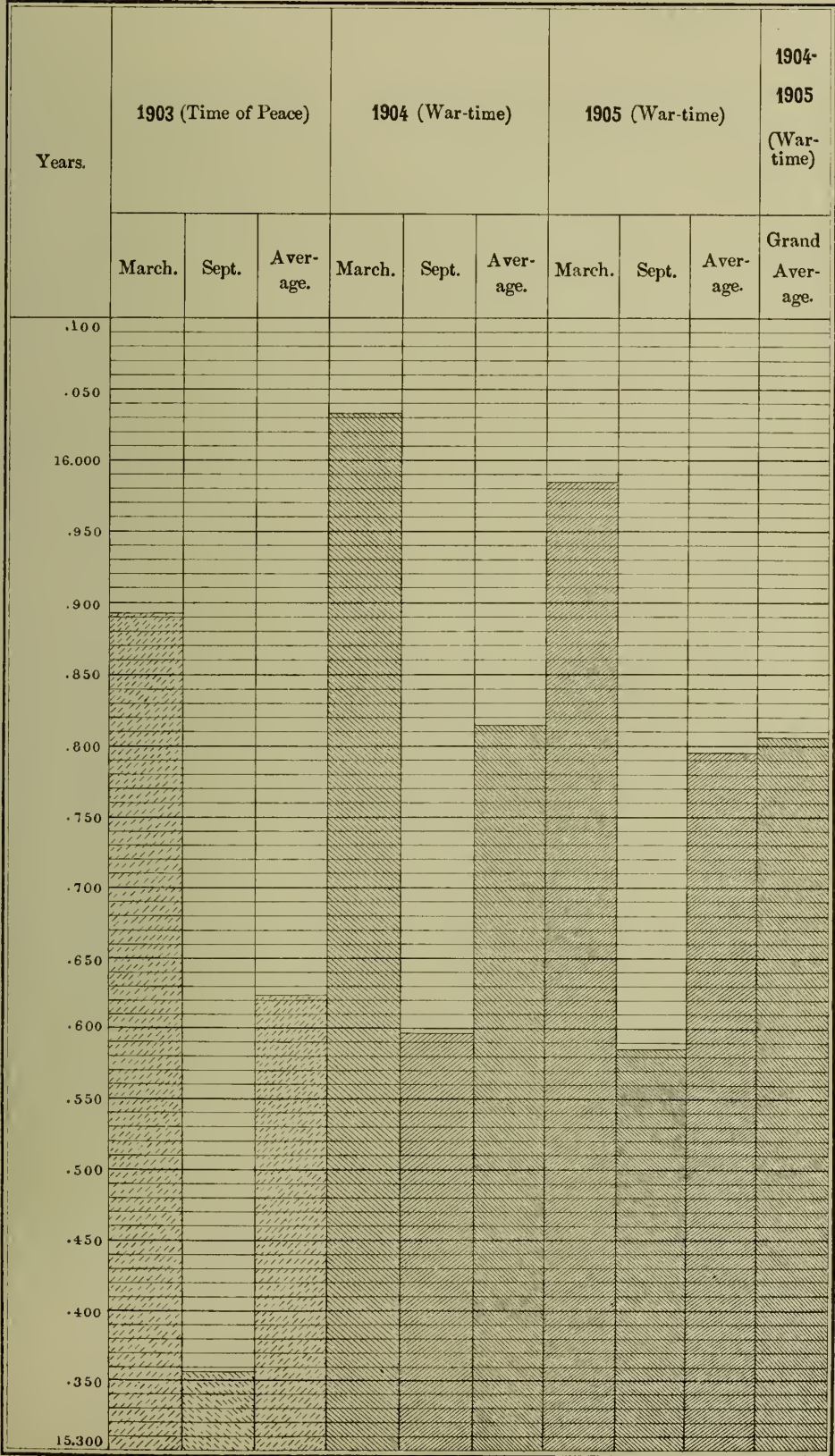
Nisshin, Otowa, Tsushima, Akashi, Chinyen, Matsushima, Idzumi, Akitsushima, Kongo, Tsukushi, Akagi, Uji, Shinonome, Oboro, Kasumi, Yugiri, Shiranui, Saikio Maru, Nikko Maru, Kumano Maru, Nippon Maru, Yobu and Daijin Maru; and the following 38 ships have each shown a decrease: *Fuji, Mikasa, Iwate, Asama, Kasagi, Chitose, Naniwa, Takachiho, Nittaka, Itsukushima, Hashidate, Chiyoda, Suna, Tatsuta, Chihaya, Fuso, Takao, Hiyei, Maya, Chokai, Banjo, Usugumo, Ikadzuchi, Inadzuma, Akabono, Sazanami, Harusame, Murakumo, Kagero, Shirakumo, Asashio, Murasame, Asagiri, Kobe Maru, Kasuga Maru, Taichu Maru, Hong Kong Maru, and Miike Maru*. All other ships and vessels are put out of comparison for the same reason as given above.

Of the body weight taken in September, 1905, the total number of men being 20,348, the average weight per head was 15 *kan* 587 *momme*, which is an increase by 231 *momme* over the average for the same period in 1903 (time of peace).

Taken severally of each ship and vessel, the following 32 have each shown an increase: *Shikishima, Idzumi, Iwate, Yakumo, Adzuma, Kasuga, Nisshin, Naniwa, Itsukushima, Nittaka, Tsushima, Suna, Chiyoda, Idzumi, Akitsushima, Yayeyama, Kongo, Shinonome, Kasumi, Harusame, Akatsuki, Fubuki, Oboro, Asashio, Kagero, Hong Kong Maru, Tainan Maru, Saikio Maru, Kwantung Maru, Yamaguchi Maru, Fukuoka Maru and Matsuyama Maru*; and the following 37 ships have each shown a decrease: *Fuji, Asahi, Asama, Tokiwa, Kasagi, Chitose, Takachiho, Chinyen, Matsushima, Hashidate, Otowa, Akashi, Tatsuta, Chihaya, Banjo, Usugumo, Sazanami, Ikadzuchi, Inadzuma, Akabono, Shirakumo, Murasame, Asagiri, Yugiri, Shiranui, Nippon Maru, Kobe Maru, Kasuga Maru, Nikko Maru, Kumano Maru, Taichu Maru, Miike Maru, Hiroshima Maru, Tategami Maru, Nisshin Maru, Santo Maru and Taisei Maru*. All other ships and vessels are put out of comparison for the aforesaid reason.

Thus, the average taken in March and September of both the years 1904 and 1905, each being compared severally with the same measurements for the preceding year 1903 (time of peace), an increase is shown in each case. Now if we take the general average of all the four averages taken in the two years,

Comparison of body-weights of the men of the Navy during
the war and those in the time of peace.





1904 and 1905, which is 15 *kan* 805 *momme*; and compare this with the general average of the two taken in March and September of 1903 (time of peace), which is 15 *kan* 624 *momme*, the former will be an increase over the latter by 181 *momme*. From this it will be seen that our men whilst engaged in the late war, though subjected to hardships and privations, increased in body weight as compared with peace time. This will be sufficient to prove that throughout all the operations of war the general conditions of health were excellent. It may fairly be concluded that the principal causes lie in the fact that our men were quite regular and good in their conduct in life, having had few chances of indulging in sensual pleasures.

The comparison of body weight of our men in time of peace and war will be shown in the table annexed.

II. The State of the Patients.

Without laying any stress on the military activities of our men during the protracted operations of the war, it is clear that they had many hardships of various kinds to contend with—severe cold alternating with severe heat, wind and waves, storms and tempests. Fortunately, pent up aboard their ships, they were largely immune from contagious and infectious diseases of all kinds, and this was a powerful contributing factor to that excellent state of health which characterized our Navy during all the stages of the war. Thus, in the period from February 6, 1904, to October 15, 1905, the aggregate number of men extending over the whole period was 26,283,540 with an average of 42,530 men per day; and the actual number of the patients, exclusive of the wounded in action, was 53,425, their aggregate for the whole period numbering 1,232,096 with an average of 1,993.67 per day receiving medical treatment, their rate per 1,000 being 46.88. When this compared with the rates before as well as after the war, their number at the rate per 1,000 is decreased by 8.74 as compared with the preceding year, by 8.84 against the average for the preceding five years; while comparing the same with that of 1906, it still shows a decrease by 6.96. Out of the above number of cases, cases under ordinary service numbered 795,62, the rate per 1,000 of men being 18.71, which being compared with the average for the

past five years is a decrease by 4.19 and compared with the year 1906 by 1.10. The cases under light-work numbered 214.22, the rate per 1,000 of men being 5.03, which compared with average for the preceding five years shows an increase by 0.55 and compared with that for the year 1906 by 0.65. The sick under rest from work were 301.85, the rate per 1,000 of men being 7.10, which compared with the average for the past five years shows a decrease by 3.62 and compared with that for the year 1906 by 0.94. The patients admitted to hospital numbered 681.99, the rate per 1,000 being 16.04, which compared with the average for the past five years was a decrease by 1.61 and compared with 1906 by 5.60. The following table will show the above figures as distributed among the forces afloat and ashore, at the front line and at home :

**TABLE SHOWING THE NUMBER OF CASES AMONG THE FORCES
AFLOAT AND ASHORE AT THE FRONT AS WELL AS AT HOME
(INCLUSIVE OF THOSE ABOVE WARRANT OFFICERS)**

(From February 6, 1904 To October 15, 1905.)

Force.	Average Strength.	Cases under Ordinary Work.		Cases under Light Work.		Cases under Rest from Work.		Cases admitted to Hospital.		Total.	
		Average No. per Day.	Ratio per 1,000 of Average Strength	Average No. per Day.	Ratio per 1,000 of Average Strength	Average No. per Day.	Ratio per 1,000 of Average Strength	Average No. per Day.	Ratio per 1,000 of Average Strength	Average No. per Day.	Ratio per 1,000 of Average Strength
Force Afloat at the Front	22,706	388.27	17.10	127.31	5.61	138.79	6.11	74.32	3.27	728.69	32.09
Force Ashore at the Front	2,500	28.19	11.28	7.83	3.13	20.69	8.28	12.38	4.95	69.09	27.64
Force Afloat at Home	2,161	45.89	21.24	8.74	4.04	18.01	8.33	4.16	1.93	76.80	35.54
Force Ashore at Home	15,163	333.27	21.98	70.34	4.64	124.36	8.20	591.13	38.92	1,119.10	73.80
General Total ...	42,530	795.62	18.71	214.22	5.04	301.85	7.10	681.99	16.04	1,993.67	46.88

N.B. 1. The wounded in action are not included in the above table.

2. The remarkable increase in the aggregate number of cases in the shore establishments at home service, as compared with others, is due to their largeness in the aggregate of patients at hospital. This is because the larger part of the patients sent from the ship to the hospital were registered in the Naval Barracks at Naval Stations.

From the above it will be seen that the general condition of health during the war was rather better than at an ordinary time. Although the rate of the number of patients per day per 1,000 of average strength for the whole of two years 1904 and 1905 is somewhat increased as shown below; but when compared with the two years before and after as also with the average for the preceding five years, it shows a decrease in either case. Thus, the condition of health for the two years 1904 and 1905, it will be easy to conceive, was always better than it was in any ordinary year of peace.

TABLE SHOWING YEARLY NUMBER OF CASES AT THE AVERAGE PER DAY AND THEIR RATE PER 1,000 OF FORCE AT THE TIME OF WAR AND AT THE TIME PRECEDING AND FOLLOWING THE WAR (INCLUSIVE OF THOSE ABOVE WARRANT OFFICERS).

Year.	Average Strength.	Cases under Ordinary Work.		Cases under Light Work.		Cases under Rest from Work.		Cases admitted to Hospital.		Total.	
		Average No. per Day.	Ratio per 1,000 of average Strength	Average No. per Day.	Ratio per 1,000 of average Strength	Average No. per Day.	Ratio per 1,000 of average Strength	Average No. per Day.	Ratio per 1,000 of average Strength	Average No. per Day.	Ratio per 1,000 of average Strength
Average for 5 Years (from 1899 till 1903)	29,001	664	22.90	130	4.48	311	10.72	512	17.65	1,616	55.72
1903	34,918	779	22.31	160	4.58	338	3.68	664	19.02	1,942	55.62
1904	40,754	853	20.93	229	5.62	319	7.83	679	16.66	2,081	51.06
1905	43,913	778	17.72	194	4.42	284	6.47	856	19.49	2,112	48.10
1906	41,547	823	19.81	182	4.38	334	8.04	899	21.64	2,237	53.84

N. B. On and after the year 1904 the wounded in action are all excluded.

Further, to make a comparison of the sick and wounded in time of war with those in time of peace we will give a table showing a classification of yearly patients from 1899 to 1907 and another showing a comparison between war-time and peace-time conditions.

By the above classified table of diseases we see that of the rate of various diseases per 1,000 of strength in the year 1904 an increase, as compared with the preceding year, is shown in the following diseases, contagious, of circulatory and digestive systems, of systems of locomotion, and injuries; while with all other diseases more or less of a decrease is shown.

Compared with the year 1906 an increase is found in the diseases of circulatory system, digestive system ears, system of locomotion, and injuries; while all other diseases show a decrease. Of the rate per 1,000 of the strength in the year 1905, as compared with the year 1903, an increase is shown in the year 1905, as compared with the year 1903, an increase is shown in the contagious and general diseases, and in those of the nervous, digestive, urinary and generative systems and of organs of locomotion; and all other diseases are decreased. And compared with the year 1906 an upward tendency is found in the general disease, diseases of circulatory, digestive, nervous, and locomotive systems, and sundries; whilst all other diseases shew a tendency to diminish.

Of the various diseases at the rate per 1,000 of strength in the year 1905, an increase is shown over the year 1903 in the diseases, contagious and constitutional, and of the nervous, digestive, urinary, generative and locomotive organs, while all other diseases tend to diminish.

And of the various diseases at the rate per 1,000 of strength averaged for the two years 1904 and 1905, an increase is shown over the average for the preceding five years in the following diseases,—contagious diseases, diseases of the nervous and digestive systems, and of organs of locomotion; while with all other diseases a decrease is shown. Compared with the average for the two years after the war, increase is found in the general diseases, diseases of the nervous, circulatory, digestive, urinary, and generative systems, of the eye, of organs of locomotion, and injuries; with all other diseases there is decrease. Again, compared with either of the averages for the five years preceding the war and for the two years following it, an increase in the rate is shown only in the diseases of digestive and nervous systems and of organs of locomotion, as will be seen from the following table :—

TABLE SHOWING THE RATE OF PATIENTS PER 1,000 OF AVERAGE STRENGTH PER DAY FOR VARIOUS DISEASES AT WAR-TIME COMPARED WITH THOSE IN TIME OF PEACE.

Disease.	Infectious Diseases.	Constitutional Diseases.	Diseases of the Nervous System.	Diseases of the Respiratory System.	Diseases of the Circulatory System.	Diseases of the Digestive System.	Diseases of the Genito-Urinary System.	Venereal Diseases.	Diseases of the Eye.	Diseases of the Ear.	Diseases of the Skin & Connective Tissue.	Diseases of the Organs of Locomotion.	Injuries.	Other Diseases.	Total.
Average for the Preceding 5 Year.	0.86	1.78	0.86	6.22	0.70	6.69	1.25	19.24	5.59	1.02	7.40	1.28	8.63	0.02	61.70
Average for 1904—1905 (war-time).	1.19	1.56	1.27	5.65	0.68	7.36	1.16	15.71	2.93	1.00	5.55	1.41	8.18	0.02	53.67
Average for the 2 Years Following.	1.56	1.49	1.23	7.40	0.63	6.32	1.11	19.67	2.91	1.15	6.06	1.19	7.97	0.03	58.66

To sum up; of the patients for the two years, 1904 and 1905, a striking increase, as compared with the numbers for the preceding five years and with those for the two years following, was shown only in diseases of the digestive system, the nervous system and the organs of locomotion. Although in the second year of the war, as compared with the years, 1903 and 1906, a certain amount of increase is to be seen in diseases of the constitution, nervous system, urinary and generative systems, and in other wounds (mostly of the self-inflicted kind), all other diseases throughout the years of war were generally on the decrease as compared with the figures for years of peace,—and this especially with venereal diseases where the diminution was really remarkable. Here is the reason. While at the front, the discipline of our men is very strict and gives them no chance to go ashore, but in the year preceding the war, as they were about to depart for the front whence no body expected to return alive, and after their triumphant return, as an inevitable sequel to their victory, there was an irresistible tendency for them to plunge into insanitary conduct. This is a necessary evil attendant on every warlike service.

The striking increase of diseases of the digestive system in war-time as compared with times of peace is due to the fact that our men at the front are mostly engaged in severe work, exposed to cold or heat, wind or snow; and often encounter sudden changes of climate, etc.; and it is chiefly due to such climatic

affections that a comparatively larger number of our men suffered from inflammation of the pharynx and tonsils, and gastro-intestinal catarrh, etc.; whilst at the beginning of the war there were not a few of them that had their stomachs and intestines injured by unsuitable food.

In conclusion, we will state something about the general condition of the patients suffering from *kakke* in our Navy. In days gone by, the rations for our men in the Navy were provided by allowances in money; and they generally ate pure Japanese food. In those days, an extremely large number of cases of *kakke* occurred in the Navy; and when things were at their worst, such a deplorable state was reached that the rate for such patients stood at over 300 to 400 per 1,000 of average strength. However, after the reform of victualling in 1884, *kakke* cases began to decrease in number; and at the same time, with the improvements gradually introduced into the victualling system, preventive measures against *kakke* began to take effect, until it has almost disappeared since 1886. This was not only the case in time of peace, but the successful results attained were such that in the war of 1894—5, as well as at the time of the Boxer Troubles, scarcely more cases were recorded than at any ordinary time. In the present war, we stuck firmly to the same preventive measures as we had been led to adopt by our past experience. The result was: cases of *kakke* for the year 1904 were 43 (none remaining from the preceding year), and 44 for the following year 1905, making altogether 87 for the whole period of the war. The patients were mostly such recruits as had the disease reappearing after a free interval; or else signal station men and the like, who, by reason of local necessities, could obtain no food as regulated by the Navy. The cases, too being generally of a light nature, most of the patients recovered quickly,—the dead numbering not more than 3 for the year 1904. Below is a table showing the months of occurrences of cases of *kakke* among the men of the Navy and civilian employés (domestics) during the war, with a summary attached concerning their causes.

TABLE SHOWING THE MONTHS OF OCCURRENCE OF THE CASES OF *Kakke*
AMONG OUR MEN AND CIVILIAN EMPLOYEES (DOMESTICS.)

(Feb. 6, 1904—Oct. 15, 1905.)

	Month. Year.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Force Afloat at the Front.	1904	—	—	1	—	—	5	1	8	5	2	1	1	24
	1905	1	—	—	—	3	1	3	3	1	2	—	—	14
Force Ashore at the Front.	1904	—	—	—	—	—	—	—	—	—	—	—	—	—
	1905	—	—	—	—	—	—	—	—	—	—	—	—	—
Force Afloat at Home.	1904	—	—	—	—	—	—	—	—	—	—	—	—	—
	1905	—	—	—	—	—	—	—	—	—	—	—	—	—
Force Ashore at Home.	1904	—	1	1	2	—	—	1	5	4	1	—	4	19
	1905	—	—	—	1	1	5	4	7	2	10	—	—	30
General Total.	1904	—	1	2	2	—	5	2	13	9	3	1	5	43
	1905	1	—	—	1	4	6	7	10	3	12	—	—	44

As shown in the above table, the cases of *kakke* occurred mostly in August. The two months of September and October, and of June and July come next in number, whilst the number is very small in the period from January to May.

An investigation made into the causes of occurrence has shown the following results :—

Of the total number of cases, 87, those which are chiefly attributable to food, e. g. the impossibility of obtaining a regular supply of food on account of their special service, or, if supplied, the non-acceptance of the prescribed quantity on account of predisposition against that kind of food or a disorder in their digestive organs, etc.—were 59; whilst those recognizable as a reappearance of the disease, with which they had been suffering before they entered the Navy, or who had previously suffered from the disease and now had it recurred, owing to disorders in their digestive organs or by over-exertion, etc.—were 21; and of the remaining 7 the causes were unknown.

Thus, the *kakke* patients during the war were extremely few; but among those other than the men of the Navy, and who did not take the prescribed food, such as workmen, coolies, sailors, boatmen, and members of the Red Cross

Relief Corps, quite a large number of cases were reported. Thus, the *kakke* patients outside the circle of our men for the two years, 1904 and 1905, numbered altogether 390, the ratio per 1,000 of average strength being 5.13. These cases occurred mostly during the first few months of the war. Gradually, afterwards, by the time their food came to be bettered and to be made the same as that regulated by the Navy, the cases began to disappear. This may serve as a good example to show the effectiveness of our naval victualling as a preventive against *kakke*. Perhaps a better instance may be drawn from our Naval Heavy Gun Brigade. This division joined the Third Army and took part in the attack upon Port Arthur from the beginning of July, 1904, until its fall. When it was first attached to the Third Army, the allowances for the division were put under the charge of the Army. But owing to the differences which naturally exist between the victuallings of the Army and Navy, some anxiety was felt for the health of these men who had so long been accustomed to food as regulated by the Navy, when they were made at once to depend solely upon the rations as provided by the Army. For this reason, it was arranged in the middle of July, that thenceforward an additional allowance of crushed barley and meat, besides the allowance from the Army, should be supplied from the Navy to make up for the difference. In this way, they came to be provided with food almost equal to that regulated by the Navy. The consequence was, that, for the six months after they joined in the attacks upon Port Arthur and participated in all the hardships of the men of our Army, though, indeed, several hundreds of them were killed and wounded, still the general condition of their health was extremely good, none of them having been caught by an infectious disease, nor by *kakke*, while on the contrary a great many cases of *kakke* occurred among the men of the Army, and many of them had to be sent home.

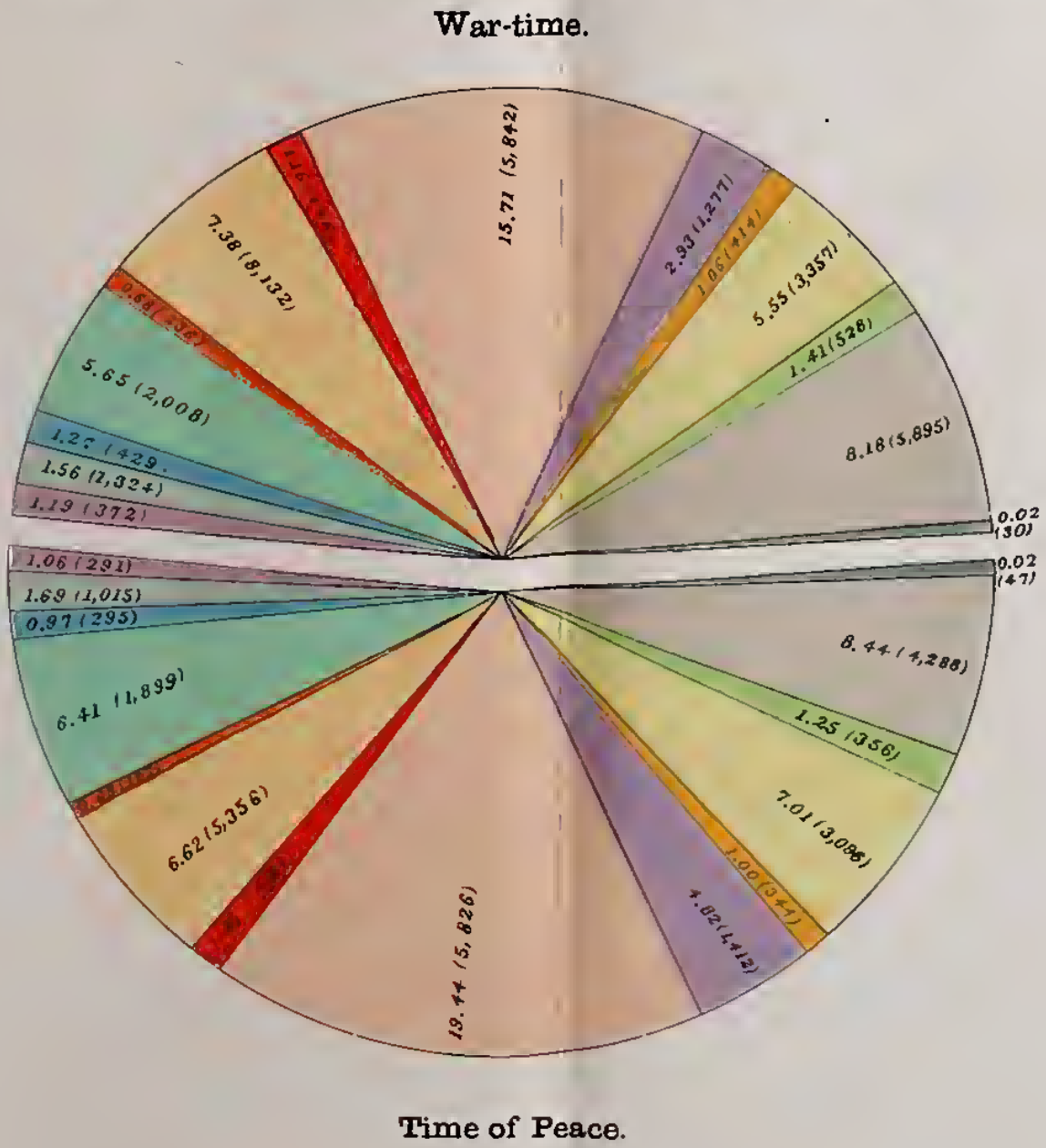
In addition to the above, the details about the patients in general during the war may be seen from the statistical tables annexed.

COMPARISON BETWEEN CASES OF DISEASE AND INJURY
IN WAR-TIME AND THOSE IN TIME OF PEACE.

(Showing daily average number of cases per 1,000
of force; the figures in parenthesis show actual number of cases.)

	1899	1900	1901	1902	1903	1904	1905	1906	1907	Average for the nine Years.
Infectious Diseases.	0.85 (1133)	0.77 (1781)	1.11 (212)	0.92 (270)	0.83 (143)	1.11 (353)	1.27 (380)	1.42 (386)	1.63 (587)	1.03 (309)
General Diseases.	1.64 (316)	1.77 (859)	2.01 (1,281)	1.92 (1,086)	1.54 (1,092)	1.42 (1,173)	1.70 (1,474)	1.53 (1,038)	1.44 (1,232)	1.66 (1,083)
Diseases of the Nervous System.	0.90 (212)	0.77 (246)	0.79 (222)	0.90 (326)	1.01 (296)	0.93 (376)	1.60 (482)	1.36 (400)	1.10 (364)	1.03 (325)
Diseases of the Re- spiratory System.	6.19 (1,437)	5.81 (1,620)	6.03 (1,787)	6.34 (1,852)	6.73 (2,008)	5.61 (2,012)	5.69 (2,004)	8.25 (2,317)	6.55 (2,272)	6.36 (1,923)
Diseases of the Cir- culatory System.	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)
Diseases of the Digestive System.	7.29 (3,886)	6.76 (4,391)	6.65 (4,898)	6.61 (5,623)	6.36 (6,130)	7.02 (8,480)	6.84 (7,784)	6.37 (5,804)	6.28 (6,762)	6.70 (5,973)
Diseases of the Genito- urinary System.	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)
Venereal Diseases.	20.57 (4,573)	19.55 (4,421)	18.96 (5,461)	16.01 (5,007)	20.72 (6,648)	15.39 (5,048)	16.02 (6,635)	18.65 (6,548)	20.61 (7,560)	18.61 (5,830)
Diseases and Injuries of the Eye.	4.12 (1,894)	5.54 (1,457)	4.55 (1,364)	4.34 (1,412)	4.29 (1,410)	3.29 (1,418)	2.56 (1,135)	2.58 (1,082)	3.24 (1,262)	4.40 (1,382)
Diseases and Injuries of the Ear.	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)	0.77 (178)
Diseases of the Skin and Connective Tissue.	8.25 (2,605)	8.13 (2,941)	7.24 (2,877)	6.89 (3,179)	6.48 (3,199)	6.35 (3,650)	4.75 (3,064)	6.45 (3,362)	5.66 (3,506)	6.69 (3,154)
Diseases of the Organs of Locomotion.	1.47 (277)	1.37 (306)	1.16 (327)	1.14 (380)	1.25 (431)	1.52 (583)	1.29 (472)	1.29 (372)	1.09 (401)	1.28 (349)
Injuries (excluding the Wounds in Action.)	8.59 (3,155)	9.56 (3,557)	8.11 (4,199)	8.07 (4,323)	8.81 (5,224)	9.00 (6,380)	7.36 (5,409)	8.31 (4,571)	7.62 (4,586)	8.38 (4,645)
Others.	0.03 (24)	0.01 (14)	0.02 (36)	0.01 (25)	0.04 (59)	0.01 (21)	0.03 (38)	0.02 (115)	0.04 (56)	0.03 (43)
Total	67.99 (19,390)	63.05 (21,763)	60.55 (23,637)	56.87 (24,416)	61.04 (27,633)	55.25 (30,597)	52.08 (30,036)	59.23 (27,078)	58.08 (29,723)	59.23 (26,030)

AVERAGE COMPARISON BETWEEN CASES OF DISEASE AND
INJURY IN WAR TIME AND THOSE IN TIME OF PEACE.



**TABLE SHOWING THE NUMBER OF CASES OF DISEASE AND INJURY
UNDER VARIOUS CLASSES, THE NUMBER OF INVALIDINGS AND
DEATHS, WITH THE RATIOS PER 1,000 OF AVERAGE STRENGTH.**

(Feb. 6, 1904—Oct. 15, 1905. Including Officers, Warrant Officers, Cadets, Petty Officers and Men, Civilians employed as Domestics, such as Hired, Cooks, Stewards, Barbers and Servants.)

Disease or Injury.	Cases.		Dead.		Invalided.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number	Ratio per 1,000 of Strength
GENERAL DISEASES.						
Measles	52	1.23	—	—	—	—
Typhoid Fever	445	10.46	56	1.32	—	—
Para-typhoid Fever	1	0.02	—	—	—	—
Simple Continued Fever	21	0.49	—	—	—	—
Malaria	311	7.31	—	—	—	—
Dysentery	234	5.50	11	0.26	—	—
Erysipelas	7	0.16	—	—	—	—
Septicaemia	1	0.02	1	0.02	—	—
Epidemic Cerebro-spinal Meningitis	12	0.28	1	0.02	1	0.02
Influenza	970	22.81	1	0.02	—	—
Mumps	30	0.71	—	—	—	—
Acute Rheumatic Arthritis	266	6.25	1	0.02	1	0.02
Chronic Rheumatic Arthritis	176	4.14	—	—	1	0.02
Kakke	87	2.05	3	0.07	3	0.07
Leprosy	22	0.52	—	—	17	0.40
Carbon Monoxid Poisoning	5	0.12	—	—	—	—
Alcoholism	4	0.09	—	—	2	4
Petroleum Poisoning	1	0.02	—	—	—	—
Hydrochloric Acid Poisoning	1	0.02	—	—	—	—
Methyl-chlorid Gas Poison- ing	1	0.02	—	—	—	—
Scrofula	31	0.73	—	—	2	0.05
Purpura	1	0.02	1	0.02	—	—
Diabetes Mellitus	3	0.07	—	—	1	0.20

Disease or Injury.	Cases.		Dead.		Invalided.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
GENERAL DISEASES.						
Heat Stroke.....	20	0.47	1	0.02	—	—
Filaria Sanguinis	10	0.24	—	—	3	0.07
Anaemia	13	0.31	1	0.02	1	0.02
Cold	599	14.08	—	—	—	—
Total.....	3,324	78.14	77	1.79	32	0.73
DISEASES OF THE NERVOUS SYSTEM.						
Mental Affection.....	70	1.65	2	0.04	42	0.99
Epilepsy	18	0.42	—	—	5	0.12
Diseases of Peripheral Nerves	326	7.67	—	—	7	0.16
Encephalitis & Meningitis	30	0.71	7	0.16	1	0.02
Cerebral Haemorrhage	11	0.26	3	0.07	2	0.05
Locomotor Ataxia (Tabes Dorsalis)	3	0.07	—	—	1	0.02
Myelitis & Spinal Meningitis	4	0.09	3	0.07	1	0.02
Hyperaemia of the Brain...	105	2.47	—	—	—	—
Anaemia of the Brain	26	0.61	—	—	—	—
Neurotic Tachycardia	12	0.28	—	—	1	0.02
Neurasthenia	200	4.70	2	0.05	7	0.16
Hemiplegia	1	0.02	—	—	1	0.02
Spinal Paralysis.....	2	0.05	—	—	—	—
Embolism of Cerebral Arteries	1	0.02	—	—	—	—
Thomsen's Disease	1	0.02	—	—	1	0.02
Basedow's Disease	1	0.02	—	—	—	—
Total	811	19.06	17	0.39	69	1.60
DISEASES OF THE RESPIRATORY SYSTEM.						
Nasal Catarrh.....	202	4.75	—	—	—	—

Other diseases of the Nose...	70	1.65	—	—	—	—
Acute Catarrhal Laryngitis	277	6.51	—	—	—	—
Other Laryngeal Affections.	7	0.16	—	—	—	—
Acute Bronchitis.....	1,200	28.22	2	0.05	—	—
Chronic Bronchitis	184	4.33	—	—	3	0.07
Asthma.....	66	1.55	—	—	1	0.02
Croupous Pneumonia.....	81	1.90	4	0.09	1	0.02
Catarrhal Pneumonia.....	19	0.45	—	—	1	0.02
Pulmonary Gangrene.....	2	0.05	2	0.05	—	—
Pulmonary Abscess.....	1	0.02	—	—	1	0.02
Pulmonary Phthisis	476	11.19	40	0.94	363	8.54
Catarrh of the Apex.....	39	0.92	—	—	5	0.12
Distoma Pulmonale.....	21	0.49	—	—	9	0.21
Pleurisy & its Sequelae.....	752	17.68	10	0.24	71	1.67
Acute Inflammation of the Frontal Sinuses.....	2	0.05	—	—	—	—
Total.....	3,399	79.92	58	1.37	455	10.69

DISEASES OF THE CIRCULATORY SYSTEM.

Pericarditis	4	0.09	2	0.05	—	—
Valvular diseases.....	16	0.38	4	0.09	5	0.12
Endocarditis	1	0.02	—	—	—	—
Hypertrophica Cordis.....	2	0.05	—	—	—	—
Paralysis of the Heart.....	4	0.09	3	0.07	—	—
Cardiac Abscess	1	0.02	1	0.02	—	—
Myasthenia Cordis	1	0.02	1	0.02	—	—
Fatty Degeneration of the Heart	2	0.05	1	0.02	—	—
Angina Pectoris	2	0.05	—	—	—	—
Palpitation of the Heart (Tachycardia)	56	1.32	—	—	—	—
Aneurism	7	0.16	2	0.05	—	—
Varix	1	0.02	—	—	—	—
Lymphangitis	5	0.12	—	—	—	—
Phlebitis	42	0.99	—	—	—	—

Disease or Injury.	Cases.		Dead		Invalided.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE CIRCULATORY SYSTEM.						
Other diseases of Blood & Lymphatic Vessels	34	0.80	—	—	—	—
Diseases of Lymphatic Glands	277	6.51	1	0.02	—	—
Total	455	10.69	15	0.34	5	0.12
DISEASES OF THE DIGESTIVE SYSTEM						
Diseases of the Teeth & their Sequelae	329	7.74	—	—	—	—
Glossitis	2	0.05	—	—	—	—
Ulcers of the Tongue	4	0.09	—	—	—	—
Stomatitis	1	0.02	—	—	—	—
Ulcers of the Mouth	1	0.02	—	—	—	—
Catarrh of the Oesophagus...	1	0.02	—	—	—	—
Tonsillitis	998	23.47	—	—	—	—
Ulcer of the Tonsils	2	0.05	—	—	—	—
Pharyngitis	5,284	124.24	1	0.02	—	—
Other Diseases of the Mouth & Pharynx	57	1.34	—	—	—	—
Diseases of the Salivary Glands	21	0.49	—	—	—	—
Acute Gastric Catarrh	1,608	37.81	—	—	—	—
Chronic Gastric Catarrh ...	384	9.03	—	—	1	0.02
Gastralgia	358	8.42	—	—	—	—
Dyspepsia	133	3.13	—	—	—	—
Gastric Ulcer	5	0.12	1	0.02	—	—
Carcinoma of the Stomach.	1	0.02	1	0.02	—	—
Dilatation of the Stomach.	15	0.35	—	—	2	0.05
Hæmatemesis	2	0.05	—	—	—	—
Ranula	5	0.12	—	—	—	—
Acute Intestinal Catarrh ...	3,762	88.46	1	0.02	—	—
Chronic Intestinal Catarrh.	76	1.79	—	—	—	—

Epiploecle & Enterocle ...	49	1.15	—	—	1	0.02
Intestinal Obstruction	4	0.09	3	0.07	—	—
Intestinal Tuberculosis	2	0.05	1	0.02	1	0.02
Enteralgia	9	0.21	—	—	—	—
Typhlitis & Perityphlitis.	125	2.94	5	0.12	—	—
Constipation.....	3	0.07	—	—	—	—
Ascaris	140	3.29	—	—	—	—
Taeniae	58	1.36	—	—	—	—
Ankylostomiasis	39	0.92	—	—	—	—
Catarrhal Jaundice.....	223	5.24	—	—	—	—
Weil's Disease.....	1	0.02	—	—	—	—
Acute Peritonitis	20	0.47	11	0.26	1	0.02
Tuberculous Peritonitis.....	20	0.47	2	0.05	16	0.38
Ascites	1	0.02	—	—	—	—
Diseases of the Liver, Gall- bladder & Bile-duct.	12	0.28	4	0.09	2	0.05
Fistula in Ano	208	4.89	—	—	1	0.02
Haemorrhoids	428	10.06	—	—	—	—
Diseases of the Rectum & its Surroundings	442	10.39	1	0.02	3	0.07
Total	14,833	348.75	31	0.71	28	0.65

**DISEASES OF THE
GENITO-URINARY
SYSTEM.**

Nephritis	38	0.89	6	0.14	1	0.02
Cystitis	145	3.41	—	—	1	0.02
Vesical Calculus	1	0.02	—	—	1	0.02
Diseases of Prostate Gland.	5	0.12	—	—	—	—
Urethral Catarrh	18	0.42	—	—	—	—
Urethral Ulcer.....	1	0.02	—	—	—	—
Urethral Fistula.....	1	0.02	—	—	—	—
Urethral Stricture	21	0.49	—	—	—	—
Nocturnal Enuresis.....	6	0.14	—	—	—	—
Haematuria	7	0.16	—	—	—	—
Inflammation of the Sper- matic Cord	22	0.52	—	—	—	—

Disease or Injury.	Cases.		Dead.		Invalided.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE GENITO-URINARY SYSTEM.						
Hydrocele of the Spermatic Cord	1	0.02	—	—	—	—
Varicocele	18	0.42	—	—	—	—
Diseases of the Scrotum ...	33	0.78	—	—	—	—
Diseases of the Testicles & Epididymis	436	10.25	—	—	2	0.05
Hydrocele Testis	50	1.18	—	—	1	2.02
Hæmatocele Testis	1	0.02	—	—	—	—
Abscess of the Scrotum	6	0.14	—	—	—	—
Abscess of the Penis	15	0.35	—	—	—	—
Renal Colic due to Calculus...	1	0.02	—	—	—	—
Total	826	19.39	6	0.14	6	0.13
VENEREAL DISEASES.						
Gonorrhœa & its Sequelæ	3,613	84.95	—	—	4	0.09
Soft Chancre	2,823	66.38	—	—	—	—
Hard Chancre	508	11.94	—	—	—	—
Bubo Inguinalis	1,196	28.12	4	0.09	1	0.02
Secondary & Tertiary Syphilis	1,376	32.35	1	0.02	6	0.14
Total	9,516	223.74	5	0.11	11	0.25
DISEASES & INJURIES OF THE EYE.						
Diseases of the Eyelids	107	2.52	—	—	—	—
Infectious Diseases of the Conjunctiva	1,004	23.61	—	—	6	0.14
Non-infectious Diseases of the Conjunctiva	735	17.28	—	—	—	—
Diseases of the Sclera & the Cornea	305	7.17	—	—	15	0.35
Diseases of the Lacrymal Apparatus	9	0.21	—	—	—	—
Diseases of the Lens	8	0.19	—	—	2	0.05
Diseases of the Iris	25	0.59	—	—	3	0.07

Diseases of the Ciliary Body.	2	0.05	—	—	—	—
Diseases of the Choroid	1	0.02	—	—	—	—
Diseases of the Retina & the Optic Nerve	22	0.52	—	—	2	0.05
Anomalies of the Refraction & Accommodation	7	0.16	—	—	2	0.05
Functional Troubles of the Eye	24	0.56	—	—	2	0.05
Opacity of the Vitreous Body	1	0.02	—	—	1	0.02
Amblyopia	54	1.27	—	—	—	—
Foreign Bodies in the Eye...	26	0.61	—	—	—	—
Total	2,330	54.78	—	—	33	0.78

DISEASES OF THE EAR.

Diseases of the External Auditory Meatus	224	5.27	—	—	—	—
Impacted Cerumen	4	0.09	—	—	—	—
Inflammation of the Mem- brana Tympani	28	0.66	—	—	2	0.05
Hyperaemia of the Membrana Tympani	1	0.02	—	—	—	—
Rupture of the Membrana Tympani	204	4.80	—	—	6	0.14
Diseases of the Middle Ear.	222	5.22	—	—	12	0.28
Diseases of the Internal Ear.	21	0.49	—	—	3	0.07
Eustachian tubal Catarrh...	2	0.05	—	—	—	—
Stricture of Eustachian Tube	7	0.16	—	—	—	—
Impermeability of the Eus- tachian Tube	1	0.02	—	—	—	—
Foreign Bodies in the Ex- ternal Auditory Meatus.	1	0.02	—	—	—	—
Total	715	16.80	—	—	23	0.54

DISEASES OF THE SKIN & CONNECTIVE TISSUE.

Scabies	339	7.97	—	—	—	—
Eczema	482	11.33	—	—	—	—
Ringworm	125	2.94	—	—	—	—
Ulcer	352	8.28	—	—	1	0.02
Phlegmon & its Sequelae...	1,662	39.08	3	0.07	7	0.16
Furuncle & Carbuncle	2,323	54.62	—	—	—	—
Parasitis	99	2.35	—	—	1	0.02

Disease or Injury.	Cases.		Dead.		Invalided	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE SKIN & CONNECTIVE TISSUE.						
Benign Tumors	114	2.68	—	—	—	—
Erythema	26	0.61	—	—	—	—
Prurigo	9	0.21	—	—	—	—
Miliaria	8	0.19	—	—	—	—
Dermatitis	38	0.89	—	—	—	—
Subungual Panaris	15	0.35	—	—	—	—
Cutis Fissuræ	4	0.09	—	—	—	—
Eczema Intertrigo (interdigital spaces)	22	0.52	—	—	—	—
Verruca Acuminata	18	0.42	—	—	—	—
Herpes	42	0.99	—	—	—	—
Ichthyosis	2	0.05	—	—	—	—
Lichen	2	0.05	—	—	—	—
Urticaria	79	1.86	—	—	—	—
Impetigo	24	0.56	—	—	—	—
Dermatitis Bullosa	17	0.40	—	—	—	—
Elephantiasis	1	0.02	—	—	—	—
Alopecia	60	1.41	—	—	1	0.02
Tinea Vesicolor	29	0.68	—	—	—	—
Clavus	17	0.40	—	—	—	—
Verruca	3	0.07	—	—	—	—
Gangrene	2	0.05	—	—	—	—
Total	5,914	139.04	3	0.07	10	0.22
DISEASES OF THE ORGANS OF LOCOMOTION.						
Osteitis, Periostitis and their Sequæ	152	3.57	4	0.09	8	0.19
Tubercular Osteitis & Arthritis	3	0.07	1	0.02	1	0.02
Acute Arthritis	99	2.33	—	—	—	—

Chronic Arthritis	39	0.92	—	—	5	0.12
Ankylosis	3	0.07	—	—	3	0.07
Muscular Rheumatism	490	11.52	—	—	—	—
Other Diseases of the Muscles	86	2.04	—	—	—	—
Affections of Bursae	30	0.71	—	—	1	0.02
Diseases of the Tendons & Synovial Sheaths.....	48	1.13	—	—	—	—
Hydrarthrosis	1	0.02	—	—	—	—
Subluxation of the Lower Jaw	1	0.02	—	—	1	0.02
Total	952	22.40	5	0.11	19	0.44

INJURIES.

Incised Wound	497	11.69	—	—	—	—
Contusion	2,726	64.10	1	0.02	—	—
Contused Wound.....	4,456	104.77	1	0.02	17	0.40
Lacerated Wound	58	1.36	—	—	—	—
Punctured Wound	152	3.57	—	—	—	—
Bullet Wound	5	0.12	—	—	—	—
Bites	13	0.31	1	0.02	—	—
Foot Sore.....	43	1.01	—	—	—	—
Wounds from Gunpowder Explosion.....	31	0.73	14	0.33	1	0.02
Burns and Scalds	891	20.95	103	2.42	1	0.02
Frost-bite	453	10.65	—	—	2	0.05
Fracture of the Upper Arm	10	0.24	—	—	1	0.02
Fracture of the Forearm...	16	0.38	—	—	4	0.09
Fracture of the Hand	165	3.88	—	—	40	0.94
Fracture of the Femur	11	0.26	2	0.05	4	0.09
Fracture of the Leg.....	19	0.45	—	—	4	0.09
Fracture of the Foot.....	45	1.06	—	—	6	0.14
Fracture of the Skull.....	26	0.61	6	0.14	—	—
Fracture of the Clavicle ...	19	0.45	—	—	1	0.02
Fracture of the Scapula ...	1	0.02	—	—	—	—
Fracture of the Cervical Ver- tebrae.....	2	0.05	2	0.05	—	—
Fracture of the Dorsal Ver- tebrae	1	0.02	—	—	—	—

Disease or Injury.	Cases.		Dead.		Invalided.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
INJURIES.						
Fracture of the Ribs.....	19	0.45	1	0.02	—	—
Fracture of the Pelvis.....	5	0.12	1	0.02	—	—
Fracture of the Patella	1	0.02	—	—	1	0.02
Fracture of Incisors	1	0.02	—	—	—	—
Sprain of Joints of the Upper Extremity	142	3.34	—	—	—	—
Sprain of Joints of the Lower Extremity.....	348	8.18	—	—	2	0.05
Sprain of the Lumbar Vertebrae.....	1	0.02	—	—	—	—
Dislocation of the Lower Jaw	1	0.02	—	—	—	—
Chondro-Costal Separation.....	2	0.05	—	—	1	0.02
Displacement of the Nasal Cartilages	1	0.02	—	—	—	—
Dislocation of the Shoulder.....	30	0.71	—	—	1	0.02
Dislocation of the Elbow ...	11	0.26	—	—	1	0.02
Dislocation of the Wrist ...	14	0.33	—	—	—	—
Dislocation of the Hip.....	1	0.02	—	—	—	—
Dislocation of the Knee ...	2	0.05	—	—	—	—
Dislocation of the Foot ...	5	0.12	—	—	—	—
Concussion of the Brain ...	11	0.26	1	0.02	1	0.02
Compression of the Brain...	2	0.05	2	0.05	—	—
Wounds attended with Loss of Soft Tissues.....	5	0.12	—	—	—	—
Abrased Wound	18	0.42	—	—	—	—
Loss of the Nail.....	4	0.09	—	—	—	—
Bites & Stings of Insects & Reptiles.....	10	0.24	—	—	—	—
Foreign Bodies penetrating into the Hand.....	2	0.05	—	—	—	—
Total	10,276	241.64	135	3.16	88	2.03
OTHER DISEASES & INJURIES.						
Drowning	34	0.80	25	0.59	—	—
Self-inflicted Wounds.....	2	0.05	—	—	—	—

Wounded & Drowned.....	256	6.02	256	6.02	—	—
Freezing to Death	2	0.05	2	0.05	—	—
Suicide	11	0.26	11	0.26	—	—
Murder	1	0.02	1	0.02	—	—
Total	306	7.19	295	6.94	—	—
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General Total	53,657	1,261.63	647	15.21	779	18.32

N.B. The figures in this table comprise 581 wounded and 367 killed at the accident of *Mikasa*, when she sank. The same applies to the following table too.

TABLE SHOWING THE NUMBER OF CASES OF DISEASE AND INJURY, THE STRENGTH, AMONG THE ENLISTED MEN OF THE NAVY AND HIRED

(Feb. 6, 1904—

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
GENERAL DISEASES.										
Measles	35	1.54	—	—	—	—	—	—	—	—
Typhoid Fever	243	10.70	31	1.37	—	—	30	12.00	2	0.80
Para-typhoid Fever	1	0.04	—	—	—	—	—	—	—	—
Simple Continued Fever...	18	0.79	—	—	—	—	1	0.40	—	—
Malaria	83	3.66	—	—	—	—	55	22.00	—	—
Dysentery	137	6.03	8	0.35	—	—	45	18.00	3	1.20
Erysipelas	4	0.18	—	—	—	—	2	0.80	—	—
Septicaemia	—	—	—	—	—	—	—	—	—	—
Epidemic Cerebro-spinal Meningitis	1	0.04	—	—	—	—	1	0.40	1	0.40
Influenza	694	30.56	—	—	—	—	13	5.20	—	—
Mumps	27	1.19	—	—	—	—	—	—	—	—
Acute Rheumatic Arthritis	158	6.96	—	—	—	—	12	4.80	—	—
Chronic Rheumatic Arthritis	88	3.88	—	—	—	—	11	4.40	—	—
Kakke.....	38	1.67	1	0.04	—	—	—	—	—	—
Lepa	10	0.44	—	—	8	0.35	2	0.80	—	—
Carbon Monoxid Poisoning	5	0.22	—	—	—	—	—	—	—	—
Alcoholism.....	1	0.04	—	—	1	0.04	—	—	—	—
Petroleum Poisoning	—	—	—	—	—	—	—	—	—	—
Hydrochloric Acid Poison- ing	—	—	—	—	—	—	—	—	—	—
Methyl-chlorid Gas Poison- ing	1	0.04	—	—	—	—	—	—	—	—
Scrofula	16	0.70	—	—	1	0.04	2	0.80	—	—
Purpura	—	—	—	—	—	—	—	—	—	—
Diabetes Mellitus	2	0.09	—	—	—	—	—	—	—	—

NUMBER OF INVALIDINGS AND DEATHS, WITH THE RATIOS PER 1,000 OF DOMESTICS ARRANGED ACCORDING TO THE PLACES OF THEIR SERVICE.

Oct. 15, 1905.)

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	11	5.09	—	—	—	—	6	0.40	—	—	—	—
—	—	13	6.02	1	0.46	—	—	159	10.49	22	1.45	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	21	9.72	—	—	—	—	152	10.02	—	—	—	—
—	—	6	2.78	—	—	—	—	46	3.03	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	1	0.07	—	—
—	—	—	—	—	—	—	—	10	0.66	—	—	1	0.07
—	—	35	16.20	—	—	—	—	228	15.04	1	0.07	—	—
—	—	2	0.93	—	—	—	—	1	0.07	—	—	—	—
1	0.40	33	15.27	—	—	—	—	63	4.15	1	0.07	—	—
—	—	10	4.63	—	—	—	—	67	4.42	—	—	1	0.07
—	—	—	—	—	—	—	—	49	3.23	2	0.13	3	0.20
2	0.80	—	—	—	—	—	—	10	0.66	—	—	7	0.46
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	3	0.20	—	—	1	0.07
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	1	0.46	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	1	0.46	—	—	—	—	12	0.79	—	—	1	0.07
—	—	—	—	—	—	—	—	1	0.07	1	0.07	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	1	0.07

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number	Ratio per 1,000 of Strength.	Number	Ratio per 1,000 of Strength.
GENERAL DISEASES.										
Heat Stroke	20	0.88	1	0.04	—	—	—	—	—	—
Filaria Sanguinis	6	0.26	—	—	1	0.04	2	0.80	—	—
Anaemia	3	0.13	—	—	1	0.04	—	—	—	—
Cold	507	22.33	—	—	—	—	10	4.00	—	—
Total	2,098	92.40	41	1.81	12	0.53	186	74.40	6	2.40
DISEASES OF THE NERVOUS SYSTEM.										
Mental Affection	28	1.23	1	0.04	14	0.62	3	1.20	1	0.40
Epilepsy	8	0.35	—	—	—	—	—	—	—	—
Diseases of the Peripheral Nerves.....	203	8.94	—	—	1	0.04	23	9.20	—	—
Encephalitis and Meningitis	4	0.18	3	0.13	—	—	1	0.40	1	0.40
Cerebral Haemorrhage.....	3	0.13	1	0.04	—	—	—	—	—	—
Locomotor Ataxia	1	0.04	—	—	—	—	—	—	—	—
Myelitis and Spinal Meningitis	2	0.09	1	0.04	—	—	—	—	—	—
Hyperaemia of the Brain.	74	3.26	—	—	—	—	7	2.80	—	—
Anaemia of the Brain.....	19	0.84	—	—	—	—	1	0.40	—	—
Neurotic Tachycardia	7	0.31	—	—	—	—	—	—	—	—
Neurasthenia	113	4.98	2	0.09	2	0.09	12	4.80	—	—
Hemiplegia.....	1	0.04	—	—	1	0.04	—	—	—	—
Spinal Paralysis	1	0.04	—	—	—	—	—	—	—	—
Embolism of Cerebral Arteries	1	0.04	—	—	—	—	—	—	—	—
Thomson's Disease.....	—	—	—	—	—	—	—	—	—	—
Basedow's Disease	—	—	—	—	—	—	—	—	—	—
Total	465	20.48	8	0.35	18	0.79	47	18.80	2	0.80
DISEASES OF THE RESPIRATORY SYSTEM										
Nasal Catarrh	141	6.21	—	—	—	—	—	—	—	—

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	2	0.13
—	—	1	0.46	—	—	—	—	9	0.59	1	0.07	—	—
—	—	19	8.79	—	—	—	—	63	4.15	—	—	—	—
3	1.20	153	70.80	1	0.46	—	—	887	58.50	29	1.91	17	1.12
2	0.80	2	0.93	—	—	1	0.46	37	2.44	—	—	25	1.65
—	—	2	0.93	—	—	1	0.46	8	0.53	—	—	4	0.26
1	0.40	20	9.25	—	—	—	—	80	5.28	—	—	5	0.33
—	—	—	—	—	—	—	—	25	1.65	3	0.20	1	0.07
—	—	—	—	—	—	—	—	8	0.53	2	0.13	2	0.13
—	—	—	—	—	—	—	—	2	0.13	—	—	1	0.07
—	—	—	—	—	—	—	—	2	0.13	2	0.13	1	0.07
—	—	4	1.85	—	—	—	—	20	1.32	—	—	—	—
—	—	3	1.39	—	—	—	—	3	0.20	—	—	—	—
—	—	2	0.93	—	—	—	—	3	0.20	—	—	1	0.07
—	—	9	4.16	—	—	—	—	66	4.35	—	—	5	0.33
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	1	0.07
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
3	1.20	42	19.44	—	—	2	0.93	257	16.95	7	0.46	46	3.03
—	—	22	10.18	—	—	—	—	39	2.57	—	—	—	—

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	2	0.93	—	—	—	—	38	2.51	—	—	—	—
—	—	20	9.23	—	—	—	—	80	5.28	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	74	34.24	—	—	—	—	428	28.23	1	0.07	—	—
1	0.40	2	0.93	—	—	—	—	71	4.68	—	—	1	0.07
—	—	3	1.39	—	—	—	—	31	2.04	—	—	1	0.07
—	—	3	1.39	—	—	—	—	49	3.23	3	0.20	1	0.07
—	—	1	0.46	—	—	—	—	5	0.33	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	1	0.07	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
19	7.60	17	7.87	2	0.93	12	5.53	214	14.11	21	1.38	123	8.11
1	0.40	9	4.16	—	—	—	—	21	1.38	—	—	1	0.07
—	—	3	1.39	—	—	—	—	3	0.79	—	—	3	0.20
3	1.20	42	19.44	—	—	1	0.46	282	18.60	4	0.26	27	1.78
—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	9.60	198	91.62	2	0.93	13	6.02	1,271	83.82	30	1.98	157	10.35
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	1	0.46	1	0.46	—	—	2	0.13	1	0.07	—	—
—	—	—	—	—	—	—	—	6	0.40	1	0.07	3	0.20
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	1	0.46	—	—	—	—	1	0.07	1	0.07	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	1	0.46	1	0.46	—	—	—	—	—	—	—	—

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE CIRCULATORY SYSTEM.										
Fatty Degeneration of the Heart	—	—	—	—	—	—	—	—	—	—
Angina Pectoris.....	2	0.09	—	—	—	—	—	—	—	—
Palpitation of the Heart...	25	1.10	—	—	—	—	2	0.80	—	—
Aneurism	1	0.04	1	0.04	—	—	—	—	—	—
Varix	1	0.04	—	—	—	—	—	—	—	—
Lymphangitis	—	—	—	—	—	—	—	—	—	—
Phlebitis.....	31	1.37	—	—	—	—	—	—	—	—
Other Diseases of the Blood and Lymphatic Vessels...	12	0.53	—	—	—	—	3	1.20	—	—
Diseases of Lymphatic Glands.....	168	7.40	—	—	—	—	16	6.40	—	—
Total.....	256	11.27	7	0.31	2	0.09	21	8.40	—	—
DISEASES OF THE DIGESTIVE SYSTEM.										
Diseases of Teeth and their Sequelæ	202	8.90	—	—	—	—	14	5.60	—	—
Glossitis	1	0.04	—	—	—	—	—	—	—	—
Ulcers of the Tongue	2	0.09	—	—	—	—	—	—	—	—
Stomatitis	1	0.04	—	—	—	—	—	—	—	—
Ulcers of the Mouth	1	0.04	—	—	—	—	—	—	—	—
Catarrh of the Oesophagus	1	0.04	—	—	—	—	—	—	—	—
Tonsillitis	569	25.06	—	—	—	—	48	19.20	—	—
Ulcers of Tonsils	2	0.09	—	—	—	—	—	—	—	—
Pharyngitis	2,674	117.77	—	—	—	—	234	93.60	—	—
Other Affections of the Mouth and Pharynx ...	44	1.94	—	—	—	—	3	1.20	—	—
Diseases of the Salivary Glands.....	9	0.40	—	—	—	—	2	0.80	—	—
Acute Gastric Catarrh.....	1,055	46.46	—	—	—	—	66	26.40	—	—

Front.			Aboard Ships at Home.						Ashore at Home.					
Invalided.			Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.		Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	—	—	—	—	—	—	—	2	0.13	1	0.07	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	2	0.93	—	—	—	—	27	1.78	—	—	—	—
—	—	—	—	—	—	—	—	—	6	0.40	1	0.07	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	2	0.93	—	—	—	—	3	0.20	—	—	—	—
—	—	—	—	—	—	—	—	—	11	0.73	—	—	—	—
—	—	—	8	3.70	—	—	—	—	11	0.73	—	—	—	—
—	—	—	12	5.55	—	—	—	—	81	5.34	1	0.07	—	—
—	—	—	27	12.49	2	0.93	—	—	151	9.96	6	0.40	3	0.20
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	37	17.12	—	—	—	—	76	5.01	—	—	—	—
—	—	—	1	0.46	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	87	40.26	—	—	—	—	294	19.39	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	444	205.46	—	—	—	—	1,932	127.45	1	0.07	—	—
—	—	—	2	0.93	—	—	—	—	8	0.53	—	—	—	—
—	—	—	2	0.93	—	—	—	—	8	0.53	—	—	—	—
—	—	—	97	44.90	—	—	—	—	390	25.72	—	—	—	—

Disease or Injury.	Aboard Ships at the Front						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE DIGESTIVE SYSTEM.										
Chronic Gastric Catarrh...	164	7.22	—	—	—	—	33	13.20	—	—
Gastralgia	239	10.53	—	—	—	—	21	8.40	—	—
Dyspepsia	56	2.47	—	—	—	—	1	0.40	—	—
Gastric Ulcer.....	3	0.13	1	0.04	—	—	—	—	—	—
Carcinoma of the Stomach	1	0.04	1	0.04	—	—	—	—	—	—
Dilatation of the Stomach.	10	0.44	—	—	—	—	—	—	—	—
Hæmatemesis	1	0.04	—	—	—	—	—	—	—	—
Ranula.....	3	0.13	—	—	—	—	—	—	—	—
Acute Intestinal Catarrh...	2,485	109.44	1	0.04	—	—	172	68.80	—	—
Chronic Intestinal Catarrh.	28	1.23	—	—	—	—	13	5.20	—	—
Epiplocele and Enterocœle.	15	0.66	—	—	—	—	5	2.00	—	—
Intestinal Obstruction	3	0.13	2	0.09	—	—	—	—	—	—
Intestinal Tuberculosis.....	—	—	—	—	—	—	—	—	—	—
Enteralgia	6	0.26	—	—	—	—	1	0.40	—	—
Typhlitis and Perityph- litis	81	3.57	3	0.13	—	—	6	2.40	1	0.40
Constipation	2	0.09	—	—	—	—	—	—	—	—
Ascariasis	103	4.54	—	—	—	—	—	—	—	—
Tæniæ	30	1.32	—	—	—	—	2	0.80	—	—
Ankylostomiasis	15	0.66	—	—	—	—	1	0.40	—	—
Catarrhal Jaundice	125	5.51	—	—	—	—	13	5.20	—	—
Weil's Disease	—	—	—	—	—	—	—	—	—	—
Acute Peritonitis.....	10	0.44	6	0.26	1	0.04	2	0.80	2	0.80
Tubercular Peritonitis.....	12	0.53	1	0.04	11	0.48	1	0.40	—	—
Ascites	1	0.04	—	—	—	—	—	—	—	—
Diseases of the Liver, Gall- bladder and Bile-duct ...	6	0.26	2	0.09	—	—	—	—	—	—

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	24	11.11	—	—	—	—	163	10.75	—	—	1	0.07
—	—	23	10.64	—	—	—	—	75	4.95	—	—	—	—
—	—	7	3.24	—	—	—	—	69	4.55	—	—	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	5	0.33	—	—	2	0.13
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	268	34.02	—	—	—	—	837	55.20	—	—	—	—
—	—	3	1.39	—	—	—	—	32	2.11	—	—	—	—
—	—	4	1.85	—	—	—	—	25	1.65	—	—	1	0.07
—	—	—	—	—	—	—	—	1	0.07	1	0.07	—	—
—	—	1	0.46	1	0.46	—	—	1	0.07	—	—	1	0.07
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	7	3.24	—	—	—	—	31	2.04	1	0.07	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	8	3.70	—	—	—	—	29	1.91	—	—	—	—
—	—	4	1.85	—	—	—	—	22	1.45	—	—	—	—
—	—	2	0.93	—	—	—	—	21	1.38	—	—	—	—
—	—	5	2.31	—	—	—	—	80	5.28	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	1	0.46	—	—	—	—	7	0.46	3	0.20	—	—
—	—	—	—	—	—	—	—	7	0.46	1	0.07	5	0.33
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	1	0.46	1	0.46	—	—	5	0.33	1	0.07	2	0.13

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE DIGESTIVE SYSTEM.										
Fistula Ani	101	4.45	—	—	1	0.04	12	4.80	—	—
Hæmorrhoids	268	11.80	—	—	—	—	43	17.20	—	—
Diseases of the Rectum & its Surroundings.....	259	11.41	—	—	1	0.04	22	8.80	—	—
Total	8,588	378.23	17	0.75	14	0.62	715	286.00	3	1.20
DISEASES OF THE GENITO-URINARY SYSTEM.										
Nephritis	23	1.01	4	0.18	—	—	1	0.40	—	—
Cystitis	56	2.47	—	—	1	0.04	21	8.40	—	—
Vesical Calculus	—	—	—	—	—	—	—	—	—	—
Diseases of the Prostate Gland	3	0.13	—	—	—	—	—	—	—	—
Urethral Catarrh	12	0.53	—	—	—	—	1	0.40	—	—
Urethral Ulcer	1	0.04	—	—	—	—	—	—	—	—
Urethral Fistula	1	0.04	—	—	—	—	—	—	—	—
Urethral Stricture	9	0.40	—	—	—	—	5	2.00	—	—
Nocturnal Enuresis	1	0.04	—	—	—	—	—	—	—	—
Hæmaturia	5	0.22	—	—	—	—	—	—	—	—
Inflammation of the Sper- matic Cord.....	16	0.70	—	—	—	—	—	—	—	—
Hydrocele of the Spermatic Cord.....	—	—	—	—	—	—	1	0.40	—	—
Varicocele	9	0.40	—	—	—	—	—	—	—	—
Diseases of the Prepuce ...	16	0.70	—	—	—	—	2	0.80	—	—
Diseases of the Testicles and Epididymis.....	225	9.91	—	—	—	—	44	17.60	—	—
Hydrocele Testis	21	0.92	—	—	—	—	7	2.80	—	—
Hæmatocele Testis	—	—	—	—	—	—	—	—	—	—
Abscess of the Scrotum ...	5	0.22	—	—	—	—	—	—	—	—

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE GENITO-URINARY SYSTEM.										
Abscess of the Penis	14	0.62	—	—	—	—	—	—	—	—
Renal Colic due to Calculus.	—	—	—	—	—	—	—	—	—	—
Total.....	417	18.36	4	0.18	1	0.04	82	32.80	—	—
VENEREAL DISEASES.										
Gonorrhea & its Sequelae	1,751	77.12	—	—	—	—	136	54.40	—	—
Soft Chancre.....	1,491	65.67	—	—	—	—	77	30.80	—	—
Hard Chancre.....	267	11.76	—	—	—	—	26	10.40	—	—
Bubo Inguinalis	503	22.15	—	—	1	0.04	40	16.00	—	—
Secondary and Tertiary Syphilis	612	26.95	—	—	1	0.04	86	34.40	—	—
Total.....	4,624	203.65	—	—	2	0.09	365	146.00	—	—
DISEASES & INJURIES OF THE EYE.										
Diseases of the Eyelids.....	58	2.55	—	—	—	—	12	4.80	—	—
Infectious Diseases of the Conjunctiva	406	17.88	—	—	—	—	48	19.20	—	—
Non-infectious Diseases of the Conjunctiva.....	401	17.66	—	—	—	—	25	10.00	—	—
Diseases of the Sclera & the Cornea.....	198	8.72	—	—	4	0.18	17	6.80	—	—
Diseases of the Lachrymal Apparatus	5	0.22	—	—	—	—	—	—	—	—
Diseases of the Lens.....	4	0.18	—	—	1	0.04	—	—	—	—
Diseases of the Iris.....	16	0.70	—	—	—	—	1	0.40	—	—
Diseases of the Ciliary Body	1	0.04	—	—	—	—	—	—	—	—
Diseases of the Choroid ...	1	0.04	—	—	—	—	—	—	—	—
Diseases of the Retina & the Optic Nerve.....	11	0.48	—	—	—	—	—	—	—	—
Anomalies of the Refraction and Accommodation.....	3	0.13	—	—	—	—	—	—	—	—
Functional Troubles of the Eye	16	0.70	—	—	—	—	—	—	—	—

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
1	0.40	47	21.75	—	—	—	—	280	18.47	2	0.13	4	0.26
—	—	226	104.58	—	—	—	—	1,500	98.93	—	—	4	0.26
—	—	205	94.86	—	—	—	—	1,050	69.25	—	—	—	—
—	—	24	11.11	—	—	—	—	191	12.60	—	—	—	—
—	—	33	15.27	1	0.46	—	—	620	40.89	3	0.20	—	—
—	—	81	37.48	—	—	1	0.46	597	39.37	1	0.07	4	0.26
—	—	569	263.30	1	0.46	1	0.46	3,958	261.03	4	0.26	8	0.53
—	—	5	2.31	—	—	—	—	32	2.11	—	—	—	—
—	—	51	23.60	—	—	—	—	4.99	32.91	—	—	6	0.40
—	—	38	17.58	—	—	—	—	2.71	17.87	—	—	—	—
1	0.40	15	6.94	—	—	2	0.93	75	4.95	—	—	8	0.53
—	—	—	—	—	—	—	—	4	0.26	—	—	—	—
—	—	1	0.46	—	—	—	—	3	0.20	—	—	1	0.07
1	0.40	—	—	—	—	—	—	8	0.52	—	—	2	0.13
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	11	0.73	—	—	2	0.13
—	—	—	—	—	—	—	—	4	0.26	—	—	2	0.13
—	—	1	0.46	—	—	—	—	7	0.46	—	—	2	0.13

Disease or Injury	Aboard Ships at the Front						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES & INJURIES OF THE EYE.										
Opacity of the Vitreous Body	1	0.04	—	—	1	0.04	—	—	—	—
Amblyopia	45	2.00	—	—	—	—	6	2.40	—	—
Foreign Bodies in the Eye.	18	0.79	—	—	—	—	—	—	—	—
Total.....	1,184	52.14	—	—	6	0.26	109	43.60	—	—
DISEASES OF THE EAR.										
Diseases of the External Auditory Meatus	130	5.73	—	—	—	—	9	3.60	—	—
Impacted Cerumen	3	0.13	—	—	—	—	—	—	—	—
Myringitis	10	0.44	—	—	—	—	1	0.40	—	—
Haemorrhage in the Membrana Tympani.....	1	0.04	—	—	—	—	—	—	—	—
Rupture of the Membrana Tympani.....	123	5.42	—	—	3	0.13	6	2.40	—	—
Diseases of the Middle Ear.	100	4.40	—	—	7	0.31	8	3.20	—	—
Diseases of the Internal Ear	17	0.75	—	—	—	—	1	0.40	—	—
Eustachian Tubal Catarrh	2	0.09	—	—	—	—	—	—	—	—
Stricture of the Eustachian Tube	4	0.18	—	—	—	—	1	0.40	—	—
Impermeability of the Eustachian Tube	1	0.04	—	—	—	—	—	—	—	—
Foreign Bodies in the External Auditory Meatus.	1	0.04	—	—	—	—	—	—	—	—
Total.....	392	17.26	—	—	10	0.44	26	10.40	—	—
DISEASES OF THE SKIN & CONNECTIVE TISSUE.										
Scabies.....	43	1.89	—	—	—	—	9	3.60	—	—
Eczema	257	11.32	—	—	—	—	31	12.40	—	—
Ringworm	55	2.42	—	—	—	—	3	1.20	—	—
Ulcer	139	6.12	—	—	1	0.04	20	8.00	—	—
Phlegmon & its Sequelae	880	38.76	1	0.04	3	0.13	44	17.60	—	—

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	3	0.20	—	—	—	—
—	—	3	1.39	—	—	—	—	5	0.33	—	—	—	—
2	0.80	114	52.75	—	—	2	0.93	923	60.87	—	—	23	1.52
—	—	7	3.24	—	—	—	—	78	5.14	—	—	—	—
—	—	1	0.46	—	—	—	—	—	—	—	—	—	—
—	—	1	0.46	—	—	—	—	16	1.06	—	—	2	0.13
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	4	1.85	—	—	1	0.46	71	4.68	—	—	2	0.13
—	—	18	8.33	—	—	—	—	96	6.33	—	—	5	0.33
—	—	—	—	—	—	—	—	3	0.20	—	—	3	0.20
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	31	14.35	—	—	1	0.46	266	17.54	—	—	12	0.79
—	—	10	4.63	—	—	—	—	277	18.27	—	—	—	—
—	—	34	15.73	—	—	—	—	160	10.55	—	—	—	—
—	—	6	2.78	—	—	—	—	61	4.02	—	—	—	—
—	—	15	6.94	—	—	—	—	178	11.74	—	—	—	—
—	—	86	39.80	1	0.46	—	—	652	43.00	1	0.07	4	0.26

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE SKIN & CONNECTIVE TISSUE.										
Furuncle & Carbuncle ...	1,486	65.45	—	—	—	—	56	22.40	—	—
Whitlow	72	3.17	—	—	1	0.04	—	—	—	—
Benign Tumors	76	3.35	—	—	—	—	6	2.40	—	—
Erythema	14	0.62	—	—	—	—	1	0.40	—	—
Prurigo	8	0.35	—	—	—	—	1	0.40	—	—
Miliaria	2	0.09	—	—	—	—	—	—	—	—
Dermatitis	13	0.57	—	—	—	—	3	1.20	—	—
Subungual Panaris	9	0.40	—	—	—	—	—	—	—	—
Cutis Fissuræ	3	0.13	—	—	—	—	—	—	—	—
Eczema Intertrigo (Interdigital spaces.)	19	0.84	—	—	—	—	1	0.40	—	—
Verruca Acuminata	12	0.53	—	—	—	—	—	—	—	—
Herpes.....	28	1.23	—	—	—	—	—	—	—	—
Ichthyosis	1	0.04	—	—	—	—	—	—	—	—
Lichen.....	—	—	—	—	—	—	—	—	—	—
Urticaria	47	2.07	—	—	—	—	5	2.00	—	—
Impetigo	12	0.53	—	—	—	—	—	—	—	—
Dermatitis Bullosa	11	0.48	—	—	—	—	2	0.80	—	—
Elephantiasis	—	—	—	—	—	—	1	0.40	—	—
Alopecia	39	1.71	—	—	1	0.04	—	—	—	—
Tinea Vesicolor.....	22	0.97	—	—	—	—	—	—	—	—
Clavus	9	0.40	—	—	—	—	—	—	—	—
Verruca	—	—	—	—	—	—	—	—	—	—
Gangrene.....	1	0.04	—	—	—	—	—	—	—	—
Total	3,258	143.49	1	0.04	6	0.26	183	73.20	—	—

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	171	79.13	—	—	—	—	6.10	40.23	—	—	—	—
—	—	5	2.31	—	—	—	—	22	1.45	—	—	—	—
—	—	6	2.78	—	—	—	—	26	1.71	—	—	—	—
—	—	—	—	—	—	—	—	11	0.73	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	6	0.40	—	—	—	—
—	—	—	—	—	—	—	—	22	1.45	—	—	—	—
—	—	—	—	—	—	—	—	6	0.40	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	2	0.93	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	6	0.40	—	—	—	—
—	—	5	2.31	—	—	—	—	9	0.59	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	2	0.93	—	—	—	—	25	1.65	—	—	—	—
—	—	1	0.46	—	—	—	—	11	0.73	—	—	—	—
—	—	2	0.93	—	—	—	—	2	0.13	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	21	1.38	—	—	—	—
—	—	1	0.46	—	—	—	—	6	0.40	—	—	—	—
—	—	4	1.85	—	—	—	—	4	0.26	—	—	—	—
—	—	—	—	—	—	—	—	3	0.20	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	350	161.96	1	0.46	—	—	2,123	140.01	1	0.07	4	0.26

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
DISEASES OF THE ORGANS OF LOCOMOTION.										
Osteitis, Periostitis & its Sequelae	90	3.96	2	0.09	2	0.09	15	6.00	—	—
Tubercular Osteitis & Arthritis	—	—	—	—	—	—	2	0.80	1	0.40
Acute Arthritis.....	50	2.20	—	—	—	—	13	5.20	—	—
Chronic Arthritis.....	12	0.53	—	—	—	—	1	0.40	—	—
Ankylosis	—	—	—	—	—	—	—	—	—	—
Muscular Rheumatism	291	12.82	—	—	—	—	36	14.40	—	—
Other Diseases of the Muscles	39	1.72	—	—	—	—	17	6.80	—	—
Affections of the Bursae ...	14	0.62	—	—	—	—	1	0.40	—	—
Diseases of the Tendons & Tendon-sheaths	30	1.32	—	—	—	—	1	0.40	—	—
Hydrarthrosis	1	0.04	—	—	—	—	—	—	—	—
Subluxation of the Lower Jaw	—	—	—	—	—	—	—	—	—	—
Total.....	527	23.21	2	0.09	2	0.09	86	34.40	1	0.40
INJURIES.										
Incised Wound	296	13.04	—	—	—	—	44	17.60	—	—
Contusion	1,877	82.67	1	0.04	—	—	109	43.60	—	—
Contused Wound	3,271	144.05	—	—	15	0.66	150	60.00	1	0.40
Lacerated Wound.....	39	1.72	—	—	—	—	1	0.40	—	—
Punctured Wound.....	79	3.48	—	—	—	—	15	6.00	—	—
Bullet Wound	3	0.13	—	—	—	—	—	—	—	—
Bites	4	0.18	—	—	—	—	2	0.80	—	—
Foot Sore	7	0.31	—	—	—	—	2	0.80	—	—
Explosion Wound.....	15	0.66	5	0.22	—	—	—	—	—	—
Burns & Scalds	737	32.46	101	4.47	1	0.04	28	11.20	2	0.80
Frost-bite	54	2.38	—	—	—	—	2	0.80	—	—

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	2	0.93	—	—	—	—	45	2.97	2	0.13	6	0.40
1	0.40	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	5	2.31	—	—	—	—	31	2.04	—	—	—	—
1	0.40	1	0.46	—	—	—	—	25	1.65	—	—	4	0.26
—	—	—	—	—	—	—	—	3	0.20	—	—	3	0.20
—	—	32	14.81	—	—	—	—	131	8.64	—	—	—	—
—	—	5	2.31	—	—	—	—	25	1.65	—	—	—	—
—	—	—	—	—	—	—	—	15	0.99	—	—	1	0.07
—	—	3	1.39	—	—	—	—	14	0.92	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	1	0.07
2	0.80	48	22.21	—	—	—	—	291	19.19	2	0.13	15	0.99
—	—	19	8.79	—	—	—	—	138	9.10	—	—	—	—
—	—	215	99.49	—	—	—	—	525	34.62	—	—	—	—
—	—	291	134.65	—	—	—	—	744	49.07	—	—	2	0.13
—	—	—	—	—	—	—	—	18	1.19	—	—	—	—
—	—	21	9.72	—	—	—	—	37	2.44	—	—	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	3	1.39	—	—	—	—	4	0.26	1	0.07	—	—
—	—	1	0.46	—	—	—	—	33	2.18	—	—	—	—
—	—	9	4.16	9	4.16	—	—	7	0.46	—	—	1	0.07
—	—	28	12.96	—	—	—	—	98	6.46	—	—	—	—
—	—	17	7.87	—	—	—	—	380	25.06	—	—	2	0.13

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
INJURIES.										
Fracture of the Upper Arm	2	0.09	—	—	—	—	1	0.40	—	—
Fracture of the Forearm...	10	0.44	—	—	2	0.09	1	0.40	—	—
Fracture of the Hand.....	126	5.55	—	—	33	1.46	4	1.60	—	—
Fracture of the Femur ...	7	0.31	2	0.09	1	0.04	1	0.40	—	—
Fracture of the Leg.....	11	0.48	—	—	4	0.18	1	0.40	—	—
Fracture of the Foot	36	1.58	—	—	5	0.22	1	0.40	—	—
Fracture of the Skull	17	0.75	4	0.18	—	—	4	1.60	—	—
Fracture of the Clavicle...	9	0.40	—	—	—	—	1	0.40	—	—
Fracture of the Scapula ...	1	0.04	—	—	—	—	—	—	—	—
Fracture of the Cervical Vertebrae	—	—	—	—	—	—	1	0.40	1	0.40
Fracture of the Dorsal Vertebrae	—	—	—	—	—	—	1	0.40	—	—
Fracture of the Ribs	8	0.35	—	—	—	—	1	0.40	—	—
Fracture of the Pelvis ...	3	0.13	1	0.04	—	—	—	—	—	—
Fracture of the Patella ...	1	0.04	—	—	1	0.04	—	—	—	—
Fracture of the Incisors...	1	0.04	—	—	—	—	—	—	—	—
Sprain of Joints of the Upper Extremity	87	3.83	—	—	—	—	11	4.40	—	—
Sprain of Joints of the Lower Extremity	182	8.02	—	—	2	0.09	20	8.00	—	—
Sprain of the Lumbar Vertebrae	—	—	—	—	—	—	—	—	—	—
Dislocation of the Lower Jaw	1	0.04	—	—	—	—	—	—	—	—
Chondro-costal Separation.	1	0.04	—	—	—	—	—	—	—	—
Displacement of the Nasal Cartilages	1	0.04	—	—	—	—	—	—	—	—
Dislocation of the Shoulder	14	0.62	—	—	1	0.04	2	0.80	—	—
Dislocation of the Elbow...	4	0.18	—	—	—	—	1	0.40	—	—
Dislocation of the Wrist.	9	0.40	—	—	—	—	—	—	—	—
Dislocation of the Hip ...	1	0.04	—	—	—	—	—	—	—	—

[illegible]

Disease or Injury.	Aboard Ships at the Front.						Ashore at the			
	Cases.		Dead.		Invalided.		Cases.		Dead.	
	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
INJURIES.										
Dislocation of the Knee...	1	0.04	—	—	—	—	1	0.40	—	—
Dislocation of the Foot ...	5	0.22	—	—	—	—	—	—	—	—
Concussion of the Brain...	9	0.40	1	0.04	1	0.04	—	—	—	—
Compression of the Brain.	1	0.04	1	0.04	—	—	1	0.40	1	0.40
Wounds attended with Loss of Soft Tissues.....	4	0.18	—	—	—	—	—	—	—	—
Abrased Wounds	15	0.66	—	—	—	—	1	0.40	—	—
Loss of Nails.....	—	—	—	—	—	—	—	—	—	—
Bites and Stings of Insects & Reptiles	4	0.18	—	—	—	—	2	0.80	—	—
Foreign Bodies penetrating into the Hand	2	0.09	—	—	—	—	—	—	—	—
Total	6,955	306.31	116	5.11	66	2.91	409	163.60	5	2.00
OTHER DISEASES & INJURIES.										
Drowning	25	1.10	16	0.70	—	—	2	0.80	2	0.80
Self-inflicted Wounds	—	—	—	—	—	—	—	—	—	—
Wounded & Drowned	252	11.10	252	11.10	—	—	—	—	—	—
Freezing to Death	—	—	—	—	—	—	—	—	—	—
Suicide	5	0.22	5	0.22	—	—	—	—	—	—
Murder	—	—	—	—	—	—	1	0.40	1	0.40
Total	282	12.42	273	12.02	—	—	3	1.20	3	1.20
Grand Total	30,882	1,360.08	493	21.71	400	17.62	2,326	930.40	22	8.80

Front.		Aboard Ships at Home.						Ashore at Home.					
Invalided.		Cases.		Dead.		Invalided.		Cases.		Dead.		Invalided.	
Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.	Number.	Ratio per 1,000 of Strength.
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	1	0.46	—	—	—	—	1	0.07	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	1	0.07	—	—	—	—
—	—	2	0.93	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	4	0.26	—	—	—	—
—	—	—	—	—	—	—	—	4	0.26	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	1.20	649	300.32	9	4.16	1	0.46	2,263	149.24	5	0.33	18	1.19
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	2	0.93	2	0.93	—	—	5	0.33	5	0.33	—	—
—	—	—	—	—	—	—	—	2	0.13	—	—	—	—
—	—	—	—	—	—	—	—	4	0.26	4	0.26	—	—
—	—	—	—	—	—	—	—	2	0.13	2	0.13	—	—
—	—	1	0.46	1	0.46	—	—	5	0.33	5	0.33	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	3	1.39	3	1.39	—	—	18	1.19	17	1.06	—	—
38	15.20	3,320	1,536.33	21	9.72	20	9.25	17,129	1,129.66	111	7.32	321	21.17

**TABLE SHOWING THE NUMBER OF CASES OF DISEASE AND
CREWS OF THE CHARTERED MERCHANT**

(Jan. 1, 1904—

Disease or Injury.	Cases.		Total.	Days' Treatment.	
	In Hospitals.	Out Hospitals.		In Hospitals.	Out Hospitals.
General Diseases	251	1,325	1,576	7,552	10,518
Diseases of the Nervous System.....	24	514	538	669	4,040
Diseases of the Respiratory System	93	956	1,049	2,566	7,531
Diseases of the Circulatory System	19	105	124	644	1,418
Diseases of the Digestive System	139	8,105	8,244	3,155	51,435
Diseases of the Genito-urinary System	19	162	181	391	1,877
Venereal Diseases.....	99	1,107	1,206	3,144	22,279
Diseases & Injuries of the Eye	95	6,365	6,460	4,144	45,018
Diseases & Injuries of the Ear.....	1	150	151	14	1,907
Diseases of the Skin & Connective Tissue.....	27	1,391	1,418	828	17,929
Diseases of the Organs of Locomotion	15	435	450	813	4,361
Injuries	827	39,950	40,777	36,867	398,185
Other Diseases & Injuries	2	11	13	34	57
Grand Total.....	1,611	60,576	62,187	60,821	566,555

**INJURY AMONG MEMBERS OF RED CROSS RELIEF PARTIES,
SHIPS, WORKMEN, BOATMEN AND COOLIES.**

Dec. 31, 1905.)

Average Sick Daily.		Ratio of Cases per 1,000 of Strength.	Recovery.	Treatment Discon- tinued.	Dead.	Patients Remaining.
In Hospitals.	Out Hospitals.					
10.33	14.39	0.62	1,153	373	46	4
0.92	5.53	0.16	398	130	7	3
3.51	10.30	0.34	863	170	10	6
0.88	1.94	0.09	72	47	4	1
4.32	70.36	1.86	7,319	900	4	21
0.54	2.57	0.08	132	46	1	2
4.30	30.48	0.87	782	404	—	20
5.67	61.58	1.68	5,632	739	—	89
0.02	2.61	0.07	118	32	—	1
1.13	24.53	0.64	1,226	186	—	6
1.11	5.97	0.18	367	81	—	2
50.43	544.71	14.83	33,399	6,093	78	1,207
0.05	0.08	*	8	—	5	—
83.20	775.04	21.39	51,469	9,201	155	1,362

TABLE SHOWING THE NUMBER OF CASES OF DISEASE AND INJURY,
AMONG THE MEMBERS OF RED CROSS RELIEF PARTIES,
BOATMEN AND COOLIES, ARRANGED ACCORD-

(Jan. 1, 1904—

Disease or Injury.	Cases.		Total.	Days' Treatment.	
	In Hospitals.	Out Hospitals.		In Hospitals.	Out Hospitals.
ABOARD SHIPS AT THE FRONT.					
General Diseases	125	775	900	3,965	5,410
Diseases of the Nervous System	14	226	240	343	1,888
Diseases of the Respiratory System	50	583	633	1,256	3,888
Diseases of the Circulatory System	12	51	63	467	728
Diseases of the Digestive System	63	4,325	4,388	1,264	24,686
Diseases of the Genito-urinary System	13	76	89	220	727
Venereal Diseases.....	30	586	616	987	11,431
Diseases & Injuries of the Eye	11	556	567	427	4,814
Diseases & Injuries of the Ear.....	—	87	87	—	991
Diseases of the Skin & Connective Tissue	15	799	814	511	10,240
Diseases of the Organs of Locomotion	7	247	254	399	2,513
Injuries	159	2,748	2,907	5,810	24,895
Other Diseases & Injuries ...	—	1	1	—	17
Total	499	11,060	11,559	15,649	92,228
ASHORE AT THE FRONT.					
General Diseases	68	448	516	2,294	4,267
Diseases of the Nervous System	4	272	276	94	1,987
Diseases of the Respiratory System	23	335	358	846	3,200
Diseases of the Circulatory System	5	44	49	158	600
Diseases of the Digestive System	61	3,462	3,523	1,545	24,371
Diseases of the Genito-urinary System	4	78	82	133	1,050

THE DAYS' TREATMENTS, THE RATIO PER 1,000 OF STRENGTH ETC.
CREWS OF THE CHARTERED MERCHANT SHIPS, WORKMEN,
ING TO THE PLACES OF THEIR SERVICE.

Dec. 31, 1905.)

Average Sick Daily.		Ratio of Cases per 1,000 of Strength.	Recovery.	Treatment Discon- tinued.	Dead.	Patients Remaining.
In Hospitals.	Out Hospitals					
5.49	7.49	3.19	655	222	22	1
0.48	2.61	0.76	160	77	3	—
1.74	5.39	1.75	548	81	3	1
0.65	1.01	0.41	36	24	3	—
1.75	34.19	8.82	3,969	419	—	—
0.30	1.01	0.32	70	18	1	—
1.37	15.83	4.22	385	231	—	—
0.59	6.67	1.78	512	54	—	1
—	1.37	0.34	68	19	—	—
0.71	14.18	3.65	729	85	—	—
0.55	3.48	0.99	203	51	—	—
8.05	34.48	10.44	2,724	170	6	7
—	0.02	*	1	—	—	—
21.67	127.74	36.67	10,060	1,451	38	10
3.33	6.25	5.94	374	124	16	2
0.14	2.91	1.89	220	50	3	3
1.24	4.69	3.67	272	76	5	5
0.23	0.88	0.69	27	20	1	1
2.26	35.68	23.45	3,070	429	4	20
0.19	1.54	1.07	54	26	—	2

Disease or Injury.	Cases.		Total.	Days' Treatment.	
	In Hospitals.	Out Hospitals.		In Hospitals.	Out Hospitals.
ASHORE AT THE FRONT.					
Veneral Diseases	64	419	483	2,012	8,418
Diseases & Injuries of the Eye	3	613	616	48	5,082
Diseases & Injuries of the Ear	—	39	39	—	662
Diseases of the Skin & Connective Tissue	5	505	510	108	6,380
Diseases of the Organs of Locomotion	6	172	178	179	1,669
Injuries	53	1,635	1,688	1,486	15,717
Other Diseases & Injuries	—	7	7	—	25
Total	296	8,029	8,325	8,903	74,428
ABOARD SHIPS AT HOME.					
General Diseases	19	6	25	558	51
Diseases of the Nervous System	1	10	11	3	64
Diseases of the Respiratory System	6	15	21	234	150
Diseases of the Circulatory System	—	5	5	—	45
Diseases of the Digestive System	5	189	194	112	1,232
Diseases of the Genito-urinary System	1	1	2	7	10
Veneral Diseases	2	75	77	63	1,595
Diseases & Injuries of the Eye	1	29	30	32	246
Diseases & Injuries of the Ear	—	1	1	—	39
Diseases of the Skin & Connective Tissue	4	54	58	159	730
Diseases of the Organs of Locomotion	—	12	12	—	148
Injuries	13	118	131	748	1,050
Other Diseases & Injuries	—	—	—	—	—
Total	52	515	567	1,916	5,360

Average Sick Daily.		Ratio of Cases per 1,000 of Strength.	Recovery.	Treatment Discontinued.	Dead.	Patients Remaining.
In Hospitals.	Out Hospitals.					
2.95	12.33	9.44	317	146	—	20
0.07	7.44	4.64	498	113	—	5
—	0.97	0.60	28	10	—	1
0.16	9.34	5.87	417	88	—	5
0.26	2.44	1.67	150	26	—	2
2.18	23.01	15.59	1,479	194	3	12
—	0.04	0.02	4	—	3	—
13.04	107.51	74.51	6,910	1,302	35	78
0.82	0.08	2.01	22	2	1	—
*	0.09	0.20	9	2	—	—
0.35	0.22	1.28	20	1	—	—
—	0.07	0.16	5	—	—	—
0.17	1.82	4.45	174	20	—	—
0.01	0.01	0.04	2	—	—	—
0.09	2.36	5.48	60	17	—	—
0.05	0.36	0.92	30	—	—	—
—	0.06	0.13	—	1	—	—
0.23	1.08	2.93	54	4	—	—
—	0.22	0.49	10	2	—	—
1.10	1.55	5.93	113	15	2	1
—	—	—	—	—	—	—
2.83	7.92	24.05	499	64	3	1

Disease or Injury.	Cases.		Total.	Days' Treatment.	
	In Hospitals.	Out Hospitals.		In Hospitals.	Out Hospitals.
ASHORE AT HOME.					
General Diseases	39	96	135	735	790
Diseases of the Nervous System	5	6	11	229	101
Diseases of the Respiratory System	14	23	37	230	293
Diseases of the Circulatory System	2	5	7	19	45
Diseases of the Digestive System	10	129	139	234	1,146
Diseases of the Genito-urinary System	1	7	8	31	90
Veneral Diseases	3	27	30	82	835
Diseases & Injuries of the Eye	79	5,168	5,247	3,637	34,876
Diseases & Injuries of the Ear	1	23	24	14	215
Diseases of the Skin and Connective Tissue	2	34	36	50	579
Diseases of the Organs of Locomotion	2	4	6	235	31
Injuries	604	35,447	36,051	28,823	256,523
Other Diseases & Injuries.	2	3	5	34	15
Total	764	40,972	41,736	24,353	295,539

Remarks: In this table, cases of disease or injury aboard ships front for 683 days; those aboard ships at home for 677 days; and those Asterisks denote those ratios too small to be inserted, as it is es-

Average Sick Daily.		Ratio of Cases per 1,000 of Strength.	Recovery.	Treatment Discon- tinued.	Dead.	Patients Remaining.
In Hospitals.	Out Hospitals.					
1.01	1.08	0.06	102	25	7	1
0.31	0.14	0.01	9	1	1	—
0.31	0.40	0.02	23	12	2	—
0.03	0.06	*	4	3	—	—
0.32	1.57	0.06	106	32	—	1
0.04	0.12	*	6	2	—	—
0.11	1.14	0.04	20	10	—	—
4.98	47.71	1.57	4,592	572	—	83
0.02	0.29	1.01	22	2	—	—
0.07	0.79	0.03	26	9	—	1
0.32	0.04	0.01	4	2	—	—
39.43	487.72	15.71	29,083	5,714	67	1,187
0.05	0.04	*	3	—	2	—
46.99	541.09	17.53	34,000	6,384	79	1,273

at the front contain those occurred for 722 days; those ashore at the
ashore at home for 731 days.

established to calculate all the ratios down to two places of decimals.

BOOK III. Battles and Injuries.

CHAPTER I.

AN OUTLINE OF THE NAVAL BATTLES, THE CASUALTIES PRODUCED AND THEIR RELIEF.

SECTION I. THE FIRST ATTACK ON PORT ARTHUR.

It was on the 6th February, 1904, that the Main Japanese Fleet composed of the *Mikasa*, *Asahi*, *Fuji*, *Yashima*, *Shikishima*, *Hatsuse*, *Idzumo*, *Adzuma*, *Yakumo*, *Tokiwa*, *Iwate*, *Chitose*, *Takasago*, *Kasagi*, and *Yoshino* attacked the Russian fleet consisting of the *Petropavlovsk*, *Sevastopol*, *Poltava*, *Peresviet*, *Pobieda*, *Tsesarevitch*, *Retvisan*, *Bayan*, *Diana*, *Askold*, *Boyarín*, *Norik* and *Pallada*, and some gunboats and destroyers at anchor in the roadstead outside of the harbour of Port Arthur. The attack was commenced at 11.55 a.m. and ceased at 12.37 p.m.

The *Mikasa* received a 10-in. shell and one or two of unknown calibre; the *Shikishima* a 15-c.m. shell; the *Hatsuse* 3 shells, a 12-in., a 12-c.m., and a 12-pounder; the *Adzuma* 2 shells or fragments, the *Yakumo* a few shells of small calibre or fragment; the *Iwate* a large number of shell fragments; and the *Kasagi* 2 shells.

The casualties on board the above-named ships were as follows. On the *Mikasa*, on the after bridge Y. Yamamoto, Chief Engineer of the First Squadron, K. Matsumura, Flag Lieutenant, K. Yoshimura, Judge Advocate of the Fleet, a midshipman and three men were wounded. On the *Fuji*, a 10-in. shell which smashed the stanchion of the fore bridge and exploded against the fore funnel killed Lieutenant Commander K. Yamanaka, the chief gunnery officer, on the fore bridge and Sub-Lieutenant Y. Miura on the upper deck; were wounded slightly or severely T. Namma, Midshipman, M. Ono, Signal Boatswain, and 2 men on the fore bridge, and also were wounded 7 petty officers and men on the upper deck; a 7.5-c.m. shell which fell on the shelter deck in the back part

wounded K. Ito, Midshipman. On the *Shikishima*, there were wounded, on the fore bridge, shelter deck, etc., 2 officers, 3 men severely and 10 slightly. On the *Hatsuse*, the explosion of a 12-c.m. shell which fell on the boat deck on the starboard side wounded, on the boat deck and the upper deck and by the conning tower in the fore part, 2 officers and 3 men slightly, and one man severely; and the explosion of a large shell which entered the admiral's bedroom killed on the main deck F. Kajimura, Midshipman, and a petty officer, and wounded 4 men severely, and a hired servant and 2 men slightly. On the *Yakumo*, a shell fragment which hit the foretop, severely wounded I. Kuwabara, Midshipman; and lastly on the *Iwate*, there were wounded, at No. 7 6-in. gun easemate, Sub-Lieutenant Y. Takahashi severely, and on the turret, the shelter deck etc. aft, an officer, a warrant officer and 6 men slightly and one man severely.

The following list shows the number of the killed and wounded in this battle, as well as the results of treatment.

Divisions.	Ships.	Immediate Death.	Died after a Time.	Died in Hospitals.	Invalided from Service.	Recovered in Hospitals.	Treated on Board and Recovered.	Total.
1st Division	<i>Mikasa</i>	—	—	—	—	4	3	7
	<i>Fuji</i>	2	—	1	3	2	7	15
	<i>Shikishima</i>	—	—	1	—	3	12	16
	<i>Hatsuse</i>	1	2	2	—	6	5	16
2nd Division	<i>Yakumo</i>	—	—	—	—	1	—	1
	<i>Tokiva</i>	—	—	—	—	—	2	2
	<i>Iwate</i>	—	—	—	2	4	9	15
3rd Division	<i>Yoshino</i>	—	—	—	—	—	1	1
General Total...		3	2	4	5	20	39	73

Remarks:—Of the above, 9 cases on the *Fuji*, *Shikishima*, *Tokiva*, *Iwate* and *Yoshino* were injured in the action but not by the enemy's fire.

Treatment of the Wounded:—On the *Mikasa*, there were two cases which

ambulance men witnessing the wound, at once caught hold of, stopping the hæmorrhage by the direct method, with application of dressing materials from the first-aid package they had with them, and afterward carried to the dressing station. In the latter place they were treated by the dry aseptic method. On the *Fuji*, seven cases were carried to the dressing station during the action without urgent relief treatment on the spot, and thus received their first-aid in the dressing station. One wounded man whose right forearm was extensively deprived of soft tissues and not worth preserving, underwent amputation; most of the rest stood in no need of any great operations and had their wounds simply dressed with application of dry aseptic gauze. The wounded on the *Shikishima* were generally but lightly injured, and most of them walked without help to the dressing station. Four only were transported, and that by the guns crew on the disengaged side of the ship. They were all treated without antiseptic solutions of any sort, and an examination of the wounds enabled the surgeons to proceed at once to the binding of the bleeding arteries, and suture. On the *Hatsuse* also, the dry aseptic method was adopted. Wherever foreign bodies could easily be seen in the wounds, they were removed, but otherwise, no deep probing of the wounds was made. When the battle was over, the patients were removed to the ordinary surgery, where the surgeons made a thorough examination of the wounded parts and treated them, taking the utmost care to preserve the affected limbs except in the case of a primary amputation of the left leg and the right great toe which they thought inevitable.

On the foretop of the *Yakumo*, a midshipman was wounded. His comrade dressed his wounds with the help of a first-aid package placed there in readiness, and brought him down by means of a stretcher to the upper deck. The ambulance men on the *Iwate* did not dress the wounds themselves, but carried them immediately to the dressing station in the after part of the ship, where they were treated by the dry aseptic method.

As above stated, on each ship of the fleet, the wounded were treated by the aseptic method as much as possible, avoiding operations except in cases which could not be delayed. Probing of the wounds and extraction of foreign bodies were not done, but the wounds were mostly left to the process of natural

healing. They were treated on their own ships for from 44 to 48 hours, and then, when the fleet came to anchor near Chemulpo, 28 cases were transferred to the *Genkai Maru*, which was to convey them back to the Naval Hospital at Sasebo. This vessel was at the time being used as a despatch boat, and was destitute of proper accommodation for patients; yet it was a step which had perforce to be taken, as no hospital ship had yet arrived. Surgeon R. Kuroda, in command of the same ship, with Assistant Surgeon S. Ikeda and a sick berth attendant from the *Mikasa*, who had temporarily joined the ship, took care of the wounded; hired servants and coolies belonging the ship assisted in the nursing.

The *Genkai Maru* arrived at Sasebo on the 13th February. A patient suffering with traumatic peritonitis from a penetrating wound of the abdomen died on the way home; the remaining 27 cases were admitted to the Sasebo Naval Hospital.

SECTION II. ACTION OFF CHEMULPO.

Almost simultaneously with the first attack on Port Arthur, our warships the *Naniwa* (flag-ship), *Asama*, *Takachiho*, *Nitaka*, *Akashi*, *Chiyoda*, and the 9th and 14th flotillas of torpedo boats fought against the Russian warships *Varyag* and *Koriets* off Chemulpo.

The medical officers had put their dressing stations in good order previous to the action, and had made every provision possible for the relief of the wounded, but in vain. Neither a shell nor even a shell fragment hit our warships. On the enemy's side the *Varyag* received numerous shells: one officer and 31 men were killed, and the captain, 5 officers and 185 men were wounded. When the fighting was over, these wounded men were received and treated by the English, French, and Italian warships at Chemulpo, but the French warship *Pascal* having to leave the port with the Russian Minister to Korea and some 70 of his suite, the wounded that had been received on board her were landed, and taken into our Red Cross Hospital, temporarily established in a part of the hospital belonging to the English church. The Russians were treated by Y. Wada, Resident Staff Surgeon at Seoul, and Mr. Matsumura, Director of the Public Hospital, Chemulpo, till the 7th of March, when they were removed to the Military Hospital Ship *Hakuai Maru*, in order to be sent to the relieving quarters specially established at Matsuyama in Iyo.

Of the wounded Russians who landed at Chemulpo from the *Pascal* fourteen were cases of a serious character, and ten were slight. When they were admitted, most of their wounds were already more or less inflamed, those which were attended with large loss of soft tissues, and mutilated wounds of arms and legs, gave signs of mortification. In one case of a very severe wound the binding of the popliteal artery caused mortification of the leg, and the man died of the accompanying septicaemia: another patient died of typhoid fever which he contracted before admission. No case of death occurred after the men were embarked on board the *Hakuai Maru*.

SECTION III. ATTEMPTS TO BLOCK THE ENTRANCE TO PORT ARTHUR.

After the night attack by our destroyers and the first bombardment by our warships, the Russian Fleet rarely came out to sea. Our Navy, therefore, repeatedly attempted to seal up the mouth of Port Arthur; the first attempt being made on the 24th of February, 1904, the second on the 27th of March, and the third on the 3rd of May.

The block-ships used on the first occasion were the *Tensin Maru*, *Hokoku Maru*, *Jinsen Maru*, *Buyo Maru*, and *Bushu Maru*, the complement in each vessel consisting of one executive officer, one engineer, two seamen, and ten to twenty stokers; that is, eleven officers and warrant officers, and sixty-six men for the whole number of ships. The block-ships in the second attempt were the *Chiyo Maru*, *Fukui Maru*, and *Yoneyama Maru*; in this case, there was one more executive officer for each vessel, the whole consisting of twelve officers and warrant officers and fifty-six men. The division for the third operation was composed of twelve vessels; namely the *Shibata Maru*, *Kokura Maru*, *Asagawo Maru*, *Mikawa Maru*, *Totomi Maru*, *Fuzan Maru*, *Yedo Maru*, *Nagato Maru*, *Odaru Maru*, *Sakura Maru*, *Sagami Maru*, and *Aikoku Maru*. On the 2nd of May, the wind which had been blowing hard since the morning became increased in violence towards night, and the commander of the division determined to delay the enterprise. It was, however, impossible for him to communicate with all the ships, and 8 of the vessels, the *Asagawo Maru*, *Mikawa Maru*, *Totomi Maru*, *Yedo Maru*, *Odaru Maru*, *Sakura Maru*, *Sagami Maru* and *Aikoku Maru* started for the mouth of the port, and discharged their part of the preconcerted plan. The complements

of these vessels at the time consisted of 24 officers and warrant officers and 134 men in all.

These operations were all accompanied by torpedo boats, charged with the duty of receiving the crews from the block-ships. These were, for the first attempt, the *Chidori*, *Hayabusa*, *Kasasagi*, and *Manadzuru* of the 14th flotilla, and the *Tsubame* of the 9th; for the second the *Aotaka*, *Kari*, and *Tsubame* of the 9th flotilla, and the *Kasasagi* and *Manadzuru* of the 14th; and for the third operation, the *Aotaka*, *Kari*, and *Hato* of the 9th flotilla, the torpedo boats No. 43, No. 42, No. 40 and 41 of the 10th, the *Chidori*, *Hayabusa*, and the torpedo boats No. 39, No. 66 and No. 71 of the 16th. On the escorting boats for the 1st and 2nd operations, there was no medical staff; everyone carried a first-aid package, and the survivors dressed their wounds while escaping in the boats. In the second attempt there were many cases of injury, of whom one died before reaching the fleet. It was therefore concluded, in preparing for the third attempt, that a medical officer should join each leading escort, and that either a sick berth steward or a sick berth attendant should go with each of the other boats. On April 29th, the Commander-in-Chief of the Combined Fleet Vice-Admiral Togo ordered Surgeon Inspector S. Sudzuki of the Combined Fleet, to issue the following suggestions:—

“1. The complement of a block-ship consists of about twenty men, irrespective of the size of the vessels.

“2. An assistant surgeon shall join each leading boat of the 9th, 10th, 14th and 16th torpedo boat flotillas, and either a sick berth steward or a sick berth attendant each of the remaining boats.

“3. Medical officers who join the leading boats shall take with them medical instruments and dressing materials necessary for urgent measures.

“4. Each boat shall be provided with a Totsuka stretcher.

“5. For use in case of burns and scalds, each boat shall be provided with diluted picric acid, olive oil and vaselin.

“6. First-aid packages have already been distributed to the crews of each block-ship.

“7. The sick berth steward or attendant shall carry a nurse's emergency

bag or the equivalent equipments.

“ 8. If any of the above articles cannot be obtained on your own ships, application may be made to the hospital ships.”

Casualties :—In the 1st attempt, a stoker from the *Yashima* was killed on the *Jinsen Maru*, and 3 men from the *Shikishima* and a petty officer from the *Asahi* were slightly wounded on the *Hokoku Maru*. The wounded on the latter vessel were received on board the torpedo boat *Hayabusa*, and afterwards received for treatment on board the *Asahi*, from which 2 were transferred on the 26th to the Hospital Ship *Kobe Maru*, and arrived at Sasebo on the 29th. The petty officer from the *Asahi* was injured in the ear, but he did not present himself to the surgeon before the 12th of April.

In the second attempt, 4 persons were killed and 4 wounded on the *Fukui Maru*, and 7 were wounded on the *Yoneyama Maru*. Lieutenant-Commander T. Hirose in charge of the *Fukui Maru*, being about to leave the vessel, discovered that Sugino, a warrant officer, was not present, and went thrice through the sinking ship in search of the missing warrant officer. At last finding the endeavour hopeless, he joined the others on the boat. A shell struck the gallant officer on the head, and the greater part of his body was blown away, only a mangled portion of flesh remaining in the boat. A stoker in the same ship was instantaneously killed with a perforating wound in the chest; a yeoman of signals was also shot through the belly, and died after reaching the *Asahi*. Engineer T. Kurita and 3 men were also wounded. On the *Yoneyama Maru*, before she sank, Lieutenant Y. Masaki, commanding the ship, Sub-Lieutenant H. Shimada and 3 men were wounded, and whilst our men were leaving her, two others received wounds. Neither the *Chiyo Maru* nor the *Yahiko Maru* had any cases of killed or wounded. The crew of the *Yoneyama Maru* was picked up at 6 a.m. by the torpedo boats *Kasasagi* and *Kari*; those of the *Fukui Maru*, who were not discovered by the escorts, were picked up by the destroyer *Kasumi* at about 6.30. The wounded on the *Yoneyama Maru* dressed their own wounds with the first-aid packages they carried, and were transferred from the escort to the *Asama*, the wounded on the *Fukui Maru* were temporarily treated in the destroyer and then removed to the *Asahi*. The Hospital Ship *Kobe Maru*

conveyed 5 cases from those ships. She arrived at Sasebo on the 31st, and transferred them to the Naval Hospital there.

In the third attempt, out of the total number of 24 officers, 24 petty officers, 19 stoker petty officers, 28 seamen and 63 stokers, there were killed 14 officers, 12 petty officers, 9 stoker petty officers, 15 seamen and 27 stokers. Engineer T. Iwase of the *Odaru Maru* was taken prisoner in a state of unconsciousness, and died afterwards in the Russian Naval Hospital. Twenty one of wounded made good their escape and were picked up by our escorting boats, and 5 were rescued by the enemy. Coming to particulars, on the *Mikawa Maru*, previous to her blowing up, a stoker who was acting as a messenger was killed, and 2 men were severely wounded; and on the escaping boat, 2 petty officers and a seaman were slightly wounded. Before the *Totomi Maru*, blew up, a yeoman of signals was severely wounded, and 2 petty officers and 2 seamen were slightly wounded; and 3 men were missing, though they had been seen entering the boat. On the *Yedo Maru* a shell struck the bridge and killed Lieutenant T. Takayanagi and one man, wounding 2 men severely and a petty officer slightly. The *Aikoku Maru*, on approaching the entrance of Port Arthur, struck on a mine, and went down carrying 8 of the crew with her. The men lost were Sub-Lieutenant H. Uchida, Assistant Engineer Y. Aoki, with 3 petty officers and 3 seamen. Among the rescued, 6 had slight wounds.

As to the fate of the crews of the *Odaru Maru*, *Sagami Maru*, *Asagawa Maru* and *Sakura Maru*, nothing was known until the capitulation of Port Arthur, when 7 of the crew of *Odaru Maru*, and 9 from the *Sagami Maru* were found alive. According to the statement of the former, Lieutenant T. Ono, in command of the *Odaru Maru*, and 2 men disappeared before the ship blew up. The rest of the crew got into a boat after she sank, and rowed out to sea steadily and with all their might. But the heavy fire from the shore killed and wounded the gallant men one after the other, and the water came leaking in from several places, and the boat was eventually capsized, her fifteen men being thrown into the sea. Seven of them, including Engineer T. Iwase, were picked up, in a state of unconsciousness, and admitted into the Russian Hospital at Port Arthur. M. Manda, Chief Stoker Petty Officer, was wounded on the left forearm and his left arm had

consequently to be amputated; 4 of them suffered from scurvy during the imprisonment. The *Sagami Maru*, having anchored at the mouth of Port Arthur Harbour, her crew all got into a boat, but the wind and waves prevented them handling their boat as they wished. Showers of shot fell on them from both shores, the boat was upset, and Lieutenant T. Yuasa, Engineer K. Yano, a Sub-Lieutenant, with 12 men, were drowned; K. Sano, Chief Stoker Petty Officer, and 8 others were taken prisoners, 7 of them subsequently suffering from scurvy. Lieutenant K. Mukai, of the *Asagawa Maru*, with all the crew under him, 18 in all, and Lieutenant Y. Shiraishi of the *Sakura Maru*, with all under him, 19 in all, were killed in the enterprise; and the corpses of Lieutenant Mukai, Engineer Shimidzu, Sub-Lieutenant Itoyama and 12 men under them, of Lieutenant Shiraishi, Engineer Terajima, Sub-Lieutenant Takahashi and 8 men, as well as those of Lieutenant Nomura, Sub-Lieutenant Kasahara and 5 men in the *Odaru Maru*, and of Lieutenant Yuasa, with 3 men under him were found towards the end of 1905, and carefully buried in the old Russian Cemetery on Pai-yü-shan. The corpse of a stoker on the *Sakura Maru* was picked up, on May 5, a little way off Port Arthur by the warship *Asahi*; the whole body was riddled with bullet wounds, all from above—an evident sign that the volley had come from some higher place thereabout.

The escorting torpedo boats, charged with the protection of the block-ships, reached the mouth of Port Arthur Harbour. No. 67 torpedo boat of the 14th flotilla, on leaving the mouth, was struck by a shell which wounded 2 men. The *Chidori* and *Hayabusa*, in the face of a heavy fire, remained near the mouth, making every effort to rescue the survivors. The latter vessel at 4.45 a.m. picked up 16 men of the *Aikoku Maru*, and, 10 minutes later, 15 from *Totomi Maru*, her companion picked up at 5.30 a.m. 16 men of the *Yedo Maru*. The *Hayabusa* was struck by a shell, and a petty officer was killed. Further at 4.30 a.m. No. 41 torpedo boat of the 10th flotilla picked up 17 men of the *Mikawa Maru* and a corpse. The *Aotaka* of the 9th flotilla received a shell, by which a seaman was so severely wounded that he subsequently died. When the escorting boats had finished picking up the survivors of the crew of the above-named 4 block-ships, they left the mouth of the harbour; and at 8 a. m. the *Chitose* and *Ha-*

yabusa transferred to the *Asama*, the crews they had rescued from the blockships to the *Asama*. Torpedo boat No. 41, ran up to the *Chokai*, and asked to her wounded men treated; but the sea being high, boating was impossible, and it went to the *Asama* and delivered the wounded.

Though the weather made the work very difficult, the warship *Asama* received the killed and wounded on the *Yedo Maru* from the *Chidori*; placing the wounded in her aft, and the killed in the fore dressing station. She then received the wounded on the *Aikoku Maru*, *Totomi Maru* and *Mikawa Maru* from the *Haya-busa* and No. 41 torpedo boat; placed the slightly wounded cases in her fore dressing station and severely wounded cases, belonging respectively to the warships *Fuji*, *Fuso* and *Iwate*, in the torpedo tube room on the lower deck. On the 7th, she sent these three men to the *Saikio Maru*, which received, on the same day, a severely wounded case from the *Yoshino*, and another slightly wounded from the *Fuji*. A man belonging to the *Kasuga Maru*, after having returned to his ship, was attacked by traumatic neuralgia, and was sent to the Takeshiki Sick Quarters. Two wounded in No. 67 torpedo boat were transferred, on the 5th, to the *Saikio Maru*, and on the 9th, entered the Naval Hospital at Sasebo, along with the rest.

SECTION IV. CASUALTIES DURING THE RECONNAISSANCE BEFORE THE BLOCKADE OF PORT ARTHUR.

Our Combined Fleet bombarded Port Arthur many times, and made several attempts to block the entrance to the harbour. On May the 26th, simultaneously with the fall of Nan-shan, a blockade of the Liao-tung Peninsula was declared. From that day onward, unceasing watch was kept over Port Arthur by destroyers, torpedo boats, cruisers and gunboats, while a number of converted ships and vedette-boats were engaged in laying mechanical mines, thereby exposing themselves to a heavy fire from the shore batteries. The enemy, on their side, took advantage of the dark nights to lay mines on the tracks of our ships and vessels. At other times, they would steam out of the harbour, and bombard the left wing of our besieging Army, on which occasions the ships of the Third Squadron often exchanged fire with them. Many catastrophes entailing heavy losses in officers and men happened to our ships and vessels from mines. Indeed the greater num-

ber of all the killed and wounded in the Navy during the war were produced by this one cause. We subjoin a brief account of these operations as far as they concern the casualties on to the ships and boats of the fleet during the reconnaissance and blockade of Port Arthur.

I. Warships and Vessels.

A Terrible Accident on the *Taihoku Maru*:—On June 13, 1904, a mechanical mine suddenly exploded on the upper deck of the ship, killed 23 persons and wounded 11: namely, Lieutenant Commander Y. Masaki, a chief warrant officer, a warrant officer and 16 men were killed outright, whilst of the wounded, Paymaster S. Morioka and 2 petty officers taken on board the *Saikio Maru*, died the same day; a civilian employé on the 14th; 3 men transferred, on the 10th of July, from the hospital ship to the Naval Hospital at Sasebo, were invalided from service, one for rupture of both tympanic membranes and concussion of the labyrinths, another for the rupture of the tympanic membranes and partial ankylosis of the left knee, and the third for a fracture of the left forearms. The civilian employé, however, left the hospital perfectly recovered. Commander K. Oda, Commandant of the Submarine Mining Corps, who was wounded on the same occasion, left the *Saikio Maru* on July 23; the others, all slightly wounded, were treated on board the *Taihoku Maru* and recovered within a few days.

Damage to the Warship *Chiyoda*:—On July 26, 1904, while engaging the enemy's warships which were bombarding the left wing of our Army from near Hsien-sheng-kiao, the *Chiyoda* struck on a mine; and the water flooded her fore magazine. Seven persons were killed and 28 wounded, most of them poisoned by carbon monoxide gas from the explosion, which they inhaled when going below to prevent the water from leaking into the third compartment. As the fore dressing station was close to the part where the explosion took place, Assistant Surgeon Y. Watanabe, wounded though he was, hastily removed the dressing station to the upper deck, and with T. Hanawa, Chief Surgeon of the ship, undertook the treatment of the wounded. On the 27th, they sent two severely and three slightly wounded men to the *Saikio Maru*; the others were treated on board the ship. All the wounded on this occasion made perfect recoveries excepting only one man, who left the Naval Hospital at Sasebo and was invalided from service.

The Casualties on the *Itsukushima*:—On the *Itsukushima*, on August 9, 1904, while off Lung-wang-tang engaging the enemy's squadron which was bombarding the left wing of our Army, Sub-Lieutenant J. Hayashi and thirteen men were killed, and seventeen wounded. Of the latter, eleven were admitted to the *Kobe Maru*, one of whom died the next day. Seven of these were transferred to the Naval Hospital at Sasebo, where five were invalided; the remaining three persons recovered on board the hospital ship.

Besides the above, the *Shikishima*, *Asahi*, *Tatsuta*, and some other vessels experienced some casualties. The largest loss (numerically) was on October 26, 1904, when four men were wounded on the *Asahi* by a floating mine, and there were five cases of scalds from a damaged boiler on the *Tatsuta* on November 21, the same year. The other injuries came in the discharge of ordinary service on board the ship.

II. Destroyers.

Engagements between Destroyers:—The first destroyer division encountered at daybreak on the 10th May, 1904, a Russian destroyer flotilla off Lao-tieh-shan Promontory; a brisk engagement ensued at close quarters. The *Asashio* received eight shells, the *Kasumi* eleven, and the *Akatsuki* more than ten. Fifteen were killed and wounded in all: namely, five killed on the *Akatsuki*, and one each on the *Kasumi* and *Asashio*; Engineer Y. Minamizawa and two others on the *Kasumi* were severely wounded, and three on the *Asashio*, two on the *Akatsuki* slightly. At 7 a.m. on the same day, off Port Arthur the third destroyer division met two of the enemy's destroyers coming back towards the harbour, disabled and sank one of them, the *Stereguschchi*. In this engagement, the *Akebono* received more than twenty shells and the *Suzanami* six; the former had a man killed, and Sub-Lieutenant Y. Shima with two men wounded; the latter had a man killed and another severely wounded; two men on the *Shinonome* had their ears injured by the discharge of the gun. On April 13, the second destroyer division fought against two of the enemy's destroyers and sunk one of them. The damages on our side were inconsiderable: only 5 persons on board the *Ikadzuchi*, and one man each on the *Akebono* and *Oboro* having been slightly wounded.

The Night Attack on the Enemy's Squadron:—From early morning on the

23rd June, 1904, the enemy's squadron began to steam out of the harbour in single file. From about noon, they began gradually to move out to the open sea with a sweeping party ahead. At about 8 p.m., they steered back toward Port Arthur and anchored that night outside the harbour. Our destroyers and torpedo boat flotillas attacked the Russian ships while at anchor; when the *Shinonome* was struck by a shell on the port side amidships of the upper deck, the splinters damaging the ward room, warrant officers' mess, galley and engine room; killing one man, and wounding Assistant Surgeon M. Miyagawa and four others. Immediately after this, she received another shell which killed two men.

The Seizure of the *Ryeshite'ni*:—At daybreak on the 15th, the destroyers *Asashio* and *Kasumi* captured the enemy's destroyer *Ryeshite'ni*, which had escaped to Chefoo from the battle on August 10. The enemy had prepared explosives under the bridge for the purpose of blowing up the ship, and the explosion of this ammunition resulted in the killing of one man of *Kasumi*, and the wounding of thirteen others. Sub-Lieutenant U. Terajima, Chief Artificer Engineer T. Sakamoto, and six men were slightly wounded during the operation.

Damages to Destroyers:—The destroyers sunk by striking on mines in the first period of the war were the *Akatsuki* and *Hayatori*. Two others met with the same accident, but fortunately escaped from sinking; namely, the *Harusame* and *Oboro*. The former ran on a mine, on the evening of the 11th October, and the portion aft of the ward room was blown up, with seven men wounded; the latter struck a floating mine on the 2nd of November at about 2 a.m., and sprung a leak in the aft boiler room; one man was killed, and eleven were slightly wounded.

As a rule, the wounded on the destroyers received first-aid treatment on board the ships, the severely wounded cases being sent as soon as possible to the nearest warship or hospital ship. Thus on March 10, Engineer Y. Minamizawa and two men of the engineer branch were taken on board the *Asahi*, and a man on the *Sazanami* was sent to the warship *Tokiwa*, all of them being admitted to the *Saikio Maru* on the following day. The same day, Sub-Lieutenant Y. Shima on the *Sazanami* was received on board the hospital ship through the torpedo boat *Tsubame*. The *Saikio Maru* arrived on the 13th at Sasebo, and transferred her wounded to the Naval Hospital there. The men who were injured, on April 13,

on board the *Ikadzuchi* of the second destroyer division were received by the *Asama*, and on the 16th, sent to the *Kobe Maru*. On the 21st, they were removed to the Naval Hospital at Maizuru.

The three persons wounded, on June 24, on the *Shirakumo*, were the same day removed to the *Saikio Maru* at the base; and through the *Kobe Maru*, were sent to the Kure Naval Hospital. The six men wounded on the occasion of the capture of the *Ryeshite!ni*, on August 12, at Chefoo, were the same day received by the *Kobe Maru*: two of them recovered on board the ship, and four were, on September 20, admitted into the Naval Hospital at Sasebo, where two of them were subsequently invalided from the service.

Of the eight wounded on the occasion of the damage to the *Harusame*, three serious cases were admitted the same day on board the *Kobe Maru*, and three others on the 12th. The three latter recovered after several days' treatment on board the hospital ship and were discharged. The former were transferred to the Sasebo Naval Hospital. Of the wounded on the *Oboro*, one man with an injury to his ear recovered and was discharged after 12 days' treatment in the Sasebo Naval Hospital.

III. Torpedo Boats.

The Sinking of Torpedo Boat No. 48 :—Torpedo boat No. 48 of the 21st flotilla, while clearing the sea in Kerr Bay on May 12, 1904, struck on a mine at 12.25 p.m., was exploded and sank; whence a great number of killed and wounded. Sub-Lieutenant H. Kageyama was shattered to pieces, a warrant officer was blown up into the air and fell into the water: his whole body was a mass of abraded wounds, and intraperitoneal bleeding setting in, he died on board the *Kobe Maru*. Moreover, five others were killed, and ten wounded. A warrant officer on torpedo boat No. 49 was struck, (fracturing the fibula of the right leg) by a stanchion which was hurled over from torpedo boat No. 48. Of the wounded, eight were picked up by the *Miyako*, and at 6 p.m. on the same day, sent on board the *Kobe Maru*. Sub-Lieutenant T. Hosoki, acting captain of torpedo boat No. 48, and two men were treated on the torpedo depôt-ship *Kunano Maru*; but a petty officer and two men were admitted to the Naval Hospital at Sasebo, through the *Kobe Maru*, on the 19th of that month.

The Sinking of Torpedo Boat No. 51 :—Torpedo boat No. 51 of the 12th flotilla attacked the enemy's warship on June 27, 1904, and had 2 persons wounded severely. On its way back to the base at 4 a.m. on the 28th, outside Siao-yao-kow it struck on a dangerous reef, and sank; and though the crew took to the boat and rowed towards the coast, the boat was upset likewise, and Sub-Lieutenant T. Gondo, the captain and 12 others were drowned.

Casualties in the 12th, 21st, 6th and 16th Flotillas :—On torpedo boat No. 55 of the 12th flotilla, while it was attacking the enemy's warship at anchor outside Port Arthur, a warrant officer was wounded by splinters of a shell which exploded on the surface of the water. Hence he was transferred to the *Saikio Maru*. On torpedo boats No. 50 and 51 of the same flotilla, which attacked the enemy's squadron under Ki-kwang-shan on the 27th, a few men were slightly wounded, and treated on the warship *Tsushima*. On torpedo boat No. 44 of the 21st flotilla, a man was, on the 25th, severely wounded by splinters of a shell which exploded on the surface of the water. When the 6th flotilla at 4 a.m. on July 8 attacked the enemy's warships outside Port Arthur Harbour, a petty officer on torpedo boat No. 58 and another on No. 59 were wounded. Torpedo boat No. 66 of the 16th flotilla having run, at 11.45 a.m. on November 23, on a mechanical mine floating 11 miles north-east of Lao-tieh-shan, the aft portion of the boat was blown off. On this occasion, two men were killed, and Lieutenant K. Tsunoda the captain, and two men were wounded.

The Torpedo Attack on the *Serastopol* :—The *Serastopol* being unable to endure the bombardment from the land, moved out the harbour at the break of December 9, and anchored under Chang-tao-shan. Torpedo attacks by our flotillas were repeated for 6 nights; 2 torpedo boats No. 53 and No. 42 were sunk, and there were some men killed and wounded on the *Aotaka*, *Tsubame*, and torpedo boats No. 58, No. 46, No. 37 and No. 44, numbering in all 34 killed and 15 wounded. Torpedo boat No. 53 of the 12th flotilla at about 3.30 a.m. on the 14th, as it is thought, sank with all her crew, numbering eighteen in toto; namely, Lieutenant T. Nagata, Sub-Lieutenant J. Yamaguchi, a warrant officer and 15 men. At 2.15 a.m. the 15th, on the torpedo boat No. 42 of the flotilla, a shell pierced the fore boiler and disabled the boat. The enemy, taking advantage

of this, concentrated their fire on the boat, killing Lieutenant H. Nakabori, the captain and six petty officers and men. A man was killed on torpedo boat No. 40, which came to the help of the disabled boat: another died from scalds on board the *Kobe Maru*. Torpedo boat No. 58 of the 6th flotilla, struck at 10.40 p.m. on the 14th, by 4 shells, had three men wounded. At 2.15 a.m. on the 15th, a 6-in. shell pierced into the fore boiler room of the *Aotaka* and 2 men were killed and Sub-Lieutenant T. Takahashi, a warrant officer and 2 men were wounded; the *Tsubame* of the 9th flotilla also received a few shots, one man was killed, and six wounded. Torpedo boats No. 46 and No. 37 of the 2nd flotilla, while retiring after having finished the attack, received some hostile shells; the latter had Assistant Engineer T. Watanabe wounded; the former, three men of the engineer branch killed. Torpedo boat No. 44 of the 21st flotilla, which alone was closely engaged with an enemy's ship, received a shell near the conning tower; Lieutenant Commander T. Yezoye, Commandant of the flotilla, being killed, and one man wounded.

(N. B. Besides the above mentioned, there occurred many other casualties among the crews of the destroyers and torpedo boats in the 3rd blocking expedition and in the Battles of the Yellow Sea and Japan Sea. About the particulars of those, see the respective chapters.)

The wounded on a torpedo boat, as a rule, were first treated temporarily with dressing materials out of a No. 4 medicine chest or from bags for first-aid packages. Then they were treated on such warships or destroyers close within call as carried surgeons; and thirdly, they were sent to a torpedo depôt-ship or hospital ship. The *Aotaka* of the 9th flotilla, which, during the night attack on the *Sevastopol*, had some men killed and wounded, returned at 5 a.m. to Siao-ping-tao and had a visit from Surgeon H. Nakagawa, Chief Surgeon of the torpedo depôt-ship *Nikko Maru* with an Assistant Surgeon, sick berth stewards and attendants, who treated the wounded and examined the dead bodies. At 9.30, the *Tsubame* also entered the port in tow of the *Hayabusa*; the chief surgeon of the depôt-ship visited it and administered first-aid measures; then bringing the 2 boats alongside the *Saikio Maru*, he removed the killed and wounded to her. The wounded at the attack on the *Sevastopol* were all on the day transferred

to the *Saikio Maru*. One died on the hospital ship, and ten were, on December 25, removed to the *Kobe Maru*, and admitted, on the 28th, to the Naval Hospital at Sasebo.

IV. Converted Gunboats.

The converted gunboats, which, having Talien Bay as their base, operated in the direction of Port Arthur, were engaged in mine-laying, watching the mouth of the harbour and clearing the sea. The killed and wounded on No. 5 and No. 6 *Uwajima Maru*, *Onogawa Maru*, *Otagawa Maru*, *Kagawa Maru* and *Ehime Maru* are mentioned below.

The converted gunboat *Uwajima Maru* No. 5 was struck at daybreak on May 30, by a shell, whilst operating outside of Port Arthur; a petty officer was killed, and four men were wounded. Again, on July 26 while clearing the sea outside Port Arthur, she was struck by two shells; three men from the *Yashima* were mortally wounded, two were wounded severely, and six slightly.

The *Uwajima Maru* No. 6 was struck, at dawn on June 7, by a shell just below the fore bridge; a man from the *Yashima* was mortally wounded, and died 3 hours after.

The explosion of a mechanical mine on board the *Onogawa Maru* killed and wounded T. Sano, Chief Artificer Engineer, and four men.

The converted gunboat *Otagawa Maru*, while laying mines outside Port Arthur, received a large shell at daybreak on July 23, two petty officers and a sick berth attendant were killed, and three others wounded. At dawn on August 8, the ship struck a mine, and sank. Lieutenant S. Wakita and one man were killed, and Assistant Engineer Nakata and eight men were wounded.

On August 4, the *Kagawa Maru* struck a mine in Talien Bay, the shock wounding 3 men: the *Yehime Maru*, while clearing the sea near Pigeon Bay, on August 22 ran on a mine, six men being wounded by the shock.

The principal casualties on board the converted gunboats were caused by the fire from shore batteries, while they were laying mines at night; and as no lights were allowed during the operations, the sick berth staff on board had to treat the wounded in the dark, much to their inconvenience. When a mine

exploded on board the *Onogawa Maru*, surgeons and attendants were despatched immediately from the *Saikio Maru* and at once began treating the wounded, four of whom were taken on board the hospital ship. The *Otagawa Maru* was struck by a shell, which, without bursting, killed three men. On her sinking, all the wounded were temporarily taken on board the converted gunboat *Mukogawa Maru*. Assistant Engineer Nakata alone was admitted to the *Kobe Maru* through the *Fuso*, and then sent back to Sasebo; all the rest were treated on the *Yashima*. Three wounded men on the *Uwajima Maru* No. 5 were the same day transferred to the *Kobe Maru*, and then sent to the Naval Hospital at Sasebo; those who were wounded while she was clearing the sea, were treated on the *Akebono*; of these, two severely and one slightly wounded cases were removed to the *Saikio Maru*, and then sent to the Naval Hospital at Sasebo; the rest were treated on the *Yashima*. Those who were wounded when the *Kagawa Maru* and *Yehime Maru* struck on mines, were not severely injured. They were treated on board the *Yashima*—none of them needing to be sent to the hospital.

V. Velette-Boats.

On the velette-boats which were engaged in the laying of mines and reconnaissances in force at the mouth of the Port Arthur Harbour, there were, till the attack of the *Sevastopol*, 63 killed and 14 wounded, as shown below.

The Velette-boat of the *Fuji*:—On July 14, 1904, the velette-boat towing a small boat with fish-torpedos on it penetrated a long way into Port Arthur, and searched for the enemy's ships. One seaman was severely wounded; and on the 24th, when the boat engaged a Russian destroyer off Hsien-shang-kiao, one man was burnt. After it went out on the 25th, nothing was heard of it. It was presumed that it had been sunk, and that S. Otsuka, Sub-Lieutenant in charge, Y. Saiki, a warrant officer, and 10 men were drowned.

The velette-boat of the *Akashi* struck a mine and sank out of Port Arthur at midnight on August 25. Sub-Lieutenant I. Takayanagi, in charge of the boat, lost his consciousness and went right under once, but happily, he came up again and was saved. The whole crew, numbering ten in all, were killed.

The vedette-boat of the *Mikasa* with the crew from the *Maya* on board having, on the night of September 13, discharged a special service, was retiring from the mouth of the harbour, when she drew upon herself a heavy fire from the shore batteries. It was not long before the boat was disabled and finally she sank with most of her crew. Only three seamen and stokers were picked up, while swimming, by the picket-boat of the *Fuji*, but two of them died shortly afterwards.

On September 15, the vedette-boat of the *Asama* was steaming towards Port Arthur when, unexpectedly, at 6.43 a.m., near Muo-tao, some mechanical mines on board exploded, the boat going down instantaneously with Assistant Engineer Y. Sasaki, Sub-Lieutenant Y. Kurokawa, and fifteen petty officers and men. On November 28, the vedette-boat of the *Hashidate* proceeded towards Port Arthur for the purpose of a reconnaissance in force, and nothing more was heard of her. T. Tsuruta, Midshipman, and ten petty officers and men were consequently presumed to be dead.

Besides the above, on June 6, the vedette-boat of the *Yakuno* was upset off Port Arthur. One petty officer and one man were drowned. On August 8, the vedette-boat of the *Fuso* was struck by a shell and had a midshipman killed, while on that of the *Mikasa*, during the night attack on the *Sevastopol*, a petty officer with two men were wounded. Moreover, the vedette-boats of the *Asama*, *Fuji*, *Asahi*, *Maya* and *Hashidate*, had a man or two wounded from time to time.

For manning the vedette-boats, volunteers were called for from the fleet. Such vedette-boats formed a division with two or three consorts, and proceeded from the base for the mouth of Port Arthur, with special duties to fulfil. If one of them happened to be disabled and sank, or if there were happened to be many wounded on her, then, as a rule, the consort or accompanying gunboat hastened to her relief; and the wounded were treated on board the gunboat or torpedo dépôt-ship close by, and then sent back to their own ship; serious cases only being sent immediately to the hospital ship. Thus the wounded on the vedette-boat of the *Fuji* were first treated on the destroyer *Akebono*, and the next day received on the *Saikio Maru*, arriving at Sasebo on August 6. When the vedette-boat

of the *Akashi* sunk, those of the *Yashima*, *Fuso* and *Matsushima*, which were near by, soon came to the help; when the vedette-boat of the *Mikasa* had lost a large number in killed and wounded, the vedette-boat of the *Fuji* gave assistance, and the wounded after receiving first-aid on board the *Chokai*, were admitted on board the Hospital Ship *Kobe Maru*. Eight survivors and two corpses from the vedette-boat of the *Asama* were received by a converted gunboat. The 3 wounded on the vedette-boat of the *Mikasa*, in the attack on the *Serastopol*, were first treated by a medical officer on the *Kumano Maru*; two of them, being transferred on the 14th to the *Kobe Maru*, and thence, on December 28, to the Naval Hospital at Sasebo. Slight wounds incurred in the discharge of duty, were at once dressed with the contents of the first-aid packages the boats had with them, and mostly healed without being transferred to the hospital ship.

VI. Sea-Sweeping Boats.

We now come to the casualties among the crews of the sea-clearing boats engaged in the clearing of the bay and harbour, after the occupation of Talien Bay and Port Arthur. To begin with, on June 13, 1904, a man was severely wounded on a clearing boat despatched from the *Shikishima* to Talien Bay; then, after the capitulation of Port Arthur, on January 22, 1905, while clearing near Lutin Rock, the steam-launch No. 22 struck on a mechanical mine; and sustained a loss of six killed and seven wounded, her whole crew being only thirteen. On June 17, four of the crew of steam-launch No. 2 had boarded a fishing boat, and were towing a mechanical mine towards the shore, when on a sudden the mine exploded and nothing remained of the men or the boat. The wounded on the vedette-boat of the *Shikishima*, who had received their wounds in Talien Bay, returned to the *Shikishima*; and the same day were sent to the *Kobe Maru*, and thence to the Naval Hospital at Sasebo. The wounded on steam-launch No. 22 were received by the temporary sea-sweeping corps at Port Arthur, and then returned to the warship *Itsukushima*; one of them, being on February 13, removed to the Naval Hospital at Sasebo. All the others, however, were treated on board, and recovered after a few days' treatment.

SECTION V. KILLED AND INJURED BY THE SINKING OF WARSHIPS AND DESTROYERS.

The warships we lost in the Yellow Sea, and especially along the coast of the Liao-tung Peninsula, from impact with mechanical mines laid by the enemy or collision with their consorts, were two battle-ships, four cruisers, four minor ships and two destroyers. (Besides these, torpedo boats No. 42, 48, 51 and 53, the converted gunboat *Otagawa Maru* and the vedette-boats of the *Fuji*, *Akashi*, *Mikasa*, *Asama*, and *Hashidate* sank in the first stage of the war.) The total loss sustained in the twelve warships amounted to 46,025 tons, which, compared to the six battle-ships, eight armoured cruisers, two armoured coast-defence vessels, twenty cruisers, eighteen minor warships, and twenty two destroyers altogether aggregating 274,184 tons, was a loss more than one sixth of the number of ships and less than one sixth of the total tonnage. These accidents entailed a loss of 1,399 killed and 194 wounded, which, compared with the total of the crews on board the warships and destroyers at the time of sinking (3,606) shows a percentage of 38.80 killed and 5.38 wounded. On the four ships *Hatsuse*, *Yoshino*, *Heiyen* and *Takasago*, which had the largest number of killed, the rate of the killed to the totals of their crews rose as high as 68.32 per cent. We proceed to a brief report of killed and wounded on each of the sunken warships.

On May 14, 1904, the *Miyako*, while engaged in the protection of the sea-sweeping boats at Kerr Bay, struck on a Russian mine, at 4.30 p.m. exploded, and sank. Two petty officers in the engineer branch were killed, and, Assistant Engineer T. Sato, and twenty-one men wounded. The wounded were first received by and treated on the *Itsukushima* and *Hashidate*; the next day, the 15th, four of them entered the *Kobe Maru*.

At 10.50 a.m. on May 15, 1904, the battle-ship *Hatsuse*, off Port Arthur, ran on a mechanical mine which exploded under her stern and damaged the rudder, so that she could not steer without being towed. A vessel was coming to her aid, and the whole crew had gathered on the upper deck, when she struck another mine, the explosion of which ignited her stern magazine. A terrible explosion ensued, and in a few minutes, the ship went down. The first mine had only

caused the death (by drowning) of a stoker in the steering engine room. The second explosion, however, killed Commander M. Arimori, Lieutenant-Commander Viscount K. Nire, Lieutenant-Commander Z. Sasaki, Engineer D. Yamaga, eleven other officers and 453 men. The ninety-two wounded; namely, three officers and others, with 248 of the crew were picked up and taken on board the *Tatsuta* and *Kasagi*. After the wounded had been treated on the two warships, most of them were transferred to the two hospital ships, from which thirty-nine were removed to the Naval Hospital at Sasebo. A civilian employé died in the hospital, one man was invalided from service, but all the rest, except those who suffered from burns and scalds, made speedy recoveries.

Some twenty minutes later the *Yashima* struck two mines. In spite of everything that could be done, she sank at 5.44 p.m., 5 miles east-north-east of Encounter Rock. As there was abundance of time, the whole crew took to the boats, and none were killed, there being only three men injured during the towing operations. Two of these entered the Naval Hospital at Kure through the *Saikio Maru*, and one was invalided from service.

The *Kasuga* collided off Shan-tung Promontory at about 1.40 a.m. on May 15, 1904, with the stern of the *Yoshino*, on the port side. The latter heeled over to starboard and settled down in deep water. The two large boats on the starboard side became over-crowded and capsized. The dense fog made it impossible for the consorts to render as much assistance, as they would otherwise have done, and a very large number of lives was in consequence lost. Including Captain G. Saiki and sixteen officers, 319 were drowned, and only 104 (three of them wounded) were rescued.

The gunboat *Oshima* was, at 2 a.m. on May 17, 1904, struck by the *Akagi* near the western coast of the Liao-tung Peninsula, and sank at 3.38 a.m. There were no casualty.

The destroyer *Akatsuki* struck, at 10.23 p.m. on the same day, against a mine off Port Arthur and sank immediately. All the officers on board and twenty-three men were lost, only thirty-six persons being saved by her consort.

The coast-defence vessel *Kaimon*, at 6.23 p.m. on July 5, 1904, struck on a mine off the South San-shan-tao and sank. Commander M. Takahashi, her

captain, Paymaster K. Tsukahara, etc., twenty-two in all, were drowned, and nine of the men rescued were found slightly wounded.

On September 3, 1904, at 10.55 a.m., the destroyer *Hayatori* ran on a mine off Siao-ping-tao and sank; Assistant Surgeon Ishikawa, and others, twenty in all, were drowned; of the fifteen survivors, 4 entered the *Kobe Maru*. Of the latter one entered the Naval Hospital at Maidzuru, and another, the one at Sasebo.

On September 18, at about 7.40 p.m., the *Heiyeen* struck a floating mine about one mile and a half to the south-west of Tich-tao and sank immediately. The sea was high at the time and the island intervening prevented the *Heiyeen* from being seen by her consort the *Saiyen*, so that there was no chance of coming to the rescue. All but a handful (only four) of the ship's company numbering 197 in all were drowned including Commander K. Asaba, the captain, and all the officers and warrant officers.

On November 6, 1904, at 7.53 a.m., the gunboat *Atago* struck on a reef, and sank before Port Arthur. There were no casualties.

While assisting the land attack on Metre Range on November 30, 1904, the coast-defence vessel *Saiyen* struck on a mine off St. Abb's Head, and sank. Thirty-eight persons were drowned, including Engineer K. Nakane, Sub-Lieutenant T. Kashiwagi, Sub-Lieutenant K. Morita, etc. Among the survivors, twenty-nine were wounded, of whom two entered the *Kobe Maru*, being afterwards removed to the Naval Hospital at Sasebo.

The cruiser *Takasago*, at 11.50 p.m., amidst wind and snow, on December 12, 1904, struck a floating mine outside Port Arthur; and finding her leaks to be beyond control, signalled for assistance to her consort. The *Otowa* hastened to her relief, lowered life-boats and did every thing in her power. By the time, however, that the life-boats reached the place where an instant before the *Takasago* had been seen, there was no trace of her to be found except two boats-full of refugees. The captain and others, who had jumped into the sea, were for the most part paralysed by the cold and drowned. Only 162 persons were picked up, of whom nine died later. Twenty of the survivors were wounded. Commander Y. Nakayama, Lieutenant-Commander K. Ogura, Staff Surgeon T. Kano, with twelve officers and others, 583 in all, were drowned; of the wounded, eight

were taken the same day to the *Kobe Maru*, and were thence removed to the Naval Hospital at Sasebo.

We shall now quote from some of the reports regarding the rescue and treatment of the crews of the sunken ships and vessels.

Report on the Sinking of the *Hatsuse*.

By Assistant Surgeon G. Nunogami, Acting Chief Surgeon.

At six in the afternoon on May 14, 1904, the *Hatsuse*, carrying the flag of Vice-Admiral Nashiba, was on her way, with the *Shikishima*, *Yashima*, *Kasagi* and *Tatsuta*, from Elliot Islands for the blockade of Port Arthur, the *Takasago* accompanying us on a special mission. The next day, the 15th, at 1.30 a.m., the *Tatsuta* started for the South San-shan Island, and the *Kasagi* increasing her speed headed for Port Arthur. The weather was clear, the sea calm, and there was a light southerly breeze. The *Hatsuse* was cleared for action and was steaming at half speed. At 10.50 a.m., about 10 miles south-east of the Lao-tieh-shan Promontory, she suddenly experienced a terrible shock right under her stern. I was disengaged at the moment, and was on the shelter deck aft, looking towards Port Arthur. No sooner did the shock come, than a dense smoke entirely covered and enveloped the stern, and the ship began to heel over to port. I made sure that it must be the explosion of a mine; and running below to the dressing station began to arrange all important papers with the help of the sick berth stewards and attendants, and at the same time sent to muster all the patients under rest.

All the water-tight doors on the lower deck had been shut, and communications with the dressing station were entirely cut off; the sick berth staff was mustered on the starboard side of the turret on the quarter deck where they did not hamper the action of the executive, bringing all the important papers with them. These were immediately transferred to one of the boats, lest some unexpected mishap should befall them. Fleet Surgeon B. Seki, the chief surgeon of the ship, while at work in his cabin on the lower deck, starboard aft, was thrown a few feet off the floor by the shock, together with the chair he was sitting on; the electric lights went out at the same instant; the splinters of broken furniture, fittings, and the like were tumbling down; and he could smell explosion-gas. He also thought

there had been the explosion of a mine, and immediately hastened to the upper deck; but found the ladders already broken. Fortunately, however, he espied a man-rope, by means of which he reached the deck. Assistant Surgeon S. Uemiyā, who was in the gun room, at once hastened to the dressing station and arranged articles necessary for the urgent relief of the wounded.

The patients under rest at the time numbered four in all. Three of them came in instantly, the remaining one, however, was only found after a long search. Of the men on the lower deck, some were rendered unconscious by the shock. Urgent measures were immediately taken, and they all soon recovered.

The first mine is said to have exploded outside the outer plating starboard of the aft steering engine compartment. A stoker who was keeping watch in it never came out again. The three stokers in the fore room barely escaped the same fate, and could not close the water-tight door between the two compartments (fore and aft), in consequence of the in-rush of water. On coming out, they closed the water-tight door in the hatchway leading into the compartment. The aft torpedo room is situated just forward of the latter, and when the water-tight door was closed, the water had already reached just 1-2 feet below the protective deck. Soon, and in spite of the assiduous efforts of the crew, the gallant ship heeled to port, and the stern sank deeper and deeper. At 12.20 p.m., the water had already reached the stern-walk.

Meanwhile all hands were summoned to the upper deck, and preparations hurried on for being towed by the *Kasagi*. Cutter No. 2 had taken one end of the port steel wire rope to the latter ship, and was taking the reeving line of the starboard steel wire rope to the same. Cutters No. 1 and 3 were put out; the steamboat had her steam up. Rafts were prepared on the starboard boat deck and quarter deck; life-buoys were untied ready for use; the steamboat was lowered, and the derricks were on the point of being rearranged, when suddenly just at 12.34 p.m., we experienced another shock below the aft turret and a terrible explosion accompanied by a tremendous uproar. Flames burst out with a deafening roar; the main-mast, derricks and funnels fell down; deck planks, wooden splinters, iron fragments flew in every direction; and the ship, suddenly heeling to port, went down and disappeared in less than two minutes.

According to the men of our ship and those of the *Kasagi* who witnessed the catastrophe from a short distance, the fore part of the ship suddenly rose and stood almost upright; the ram projected to the height of thirty feet or more; the crew fell into the sea over the side; some were scorched amidst the flames; the deafening crash of destruction mingled with the piercing cries of the drowning. As she heeled to port she disappeared from sight, and lo! a large whirlpool marking the place, where an instant before the magnificent ship had been. Numberless hammocks, rafts, timbers and the like, with drowning clinging to them, now came to the surface and then went down deep with the eddies; some of the men had lost their heads; some had been deprived of hands or legs; some were embracing each other or at the legs of others. For awhile it was an indescribable scene.

The explosion knocked me down and I fell unconscious. Some one fell on my back, and I recovered my senses. Standing up I found myself in the very centre of thick smoke, a foot ahead being utterly invisible. But at the instant the wind drove away the smoke, and I saw every sort of debris showering around me, and the blood of the killed and wounded flowing on the deck. Meanwhile the water had reached to within a foot below the deck, and I jumped into the sea, as I was, with my clothing and sword on me, and was sucked down in the whirlpool. Again, however, I rose to the surface, and looking back took a last and momentary glance at the sinking ship—half the ship already below the water, the other half swathed in curling thick clouds of orange brown smoke.

A moment later she went down, with flames bursting out furiously in every direction. I swallowed a great deal of water owing to the waves around the great eddies, and became so much out of breath and so completely exhausted that I could not continue swimming. Fortunately I espied and took hold of a hammock floating near. When I looked around, only waves and bubbles marked the spot where the *Hatsuse* had sunk. Around me were floating hammocks, rafts, tables, timbers and the like, the spaces between them being dotted as with black beans with the heads of the drowned and drowning. It was a praiseworthy fact indeed that, though the condition of our men was so terrible, and the hope of being rescued was so small, yet no one, so far as I know, cried for help. And when a life-boat approached them, they pointed out where their superiors were to be found,

and would not be rescued themselves until the latter had first been picked up. I was myself picked up by a life-boat, and then transferred to the *Kasagi*. The air temperature was ca. 50°F., but having been about twenty minutes in the water, my body was nearly frozen and I was on the verge of losing consciousness. The crew of the life-boat tore off my wet clothes, and wrapped me kindly in the blue jackets they wore. Their strict observance of discipline and their fidelity to their duties can never sufficiently be praised. Our consorts, the *Kasagi* and *Tatsuta*, did every thing they could in rescuing the drowning; and indeed it was due to these ships that a comparatively large number of men were rescued amidst such a scene of confusion. Our gratitude to them will last as long as we live.

When the rear-admiral reached the *Tatsuta*, his flag was immediately hoisted, and the ship having effected what rescues were possible, was going to draw off, when a school of sixteen destroyers came steaming swiftly out of Port Arthur, and began to chase us. The *Kasagi*, *Takasago* with the *Suma*, *Chiyoda* and *Akitsushima* of the sixth division came immediately to our help, and drove them back successfully. Then, the *Tatsuta* and *Kasagi* hastened to the base at the Elliot Islands.

Those who narrowly escaped death in this calamity were 340 men with Rear-Admiral T. Nashiba at their head; of these 216 were received on the *Tatsuta*, and 124 on the *Kasagi*; sixty-one among the former and thirty among the latter, were wounded.

The reason why there were so many survivors notwithstanding the greatness of calamity seems to be that, on the account of the first explosion, most of the crew were engaged in their duty on the upper deck; and that there were a great number of hammocks, rafts, timbers, etc., floating about. Indeed not a small number were saved by means of hammocks. But for these two causes, the catastrophe would have ended as with the *Petropavlovsk*. The experience taught us how important it was to form mantlets with hammocks in clearing for action. This plan has a twofold advantage; first, the hammocks act as a protection against splinters and shell fragments; secondly, in case of need they may supply the place of life-buoys.

It gave me a great satisfaction to learn afterwards that the above-mentioned

four patients under rest and another who had just received first-aid treatment after the first explosion were all saved.

The Medical Staff at the Time of the Explosion.

Fleet Surgeon B. Seki:—He was standing with a binocular, on the quarter deck, starboard, beside the aft-turret, and was looking at the *Yashima* astern. At the second explosion he fell on his back, having lost an arm and a leg. As to the cause of his death, I know nothing, not having been an eye-witness; but it may be presumed that it was due to a profuse hemorrhage from large blood-vessels or to drowning.

Assistant Surgeon S. Uemiya:—Before the explosion was standing on the aft shelter deck, with his face towards the starboard side, and fell down behind me at the explosion. No one knows whether he was wounded or not; but from the surrounding circumstances, it may be presumed that he had a burn or was wounded by some splinters; and the mortal cause may have been either the one or the other.

Y. Yoshida, Head Ward-Master, second class:—He was standing before the men's closets in the fore part of the upper deck, port. As this part is comparatively safe and little subject to vibration, and as no one in that part of the ship seems to have felt the shock, it is difficult to know what was the cause of his death. He may have been drowned when the ship went down.

T. Kono, Sick Berth Steward:—Was seen running by the main-mast at the time of the second explosion, and was thrown into the flames; the cause of death probably was a severe burn extending over the whole body.

T. Niizato and K. Imamura, Sick Berth Attendants:—According to a survivor, both were seen together just before the explosion, after which they were not seen again. Probably they met with the same fate as Kono.

The above six men, it is said, did not know how to swim.

K. Yasuda, Chief Sick Berth Steward:—He was a fine swimmer. He was searching in the dispensary for any important papers that might be there, when the second explosion took place: although he felt no considerable shock, he perceived that it was a mine-explosion, and hurriedly climbed up through the first fore hatch to the upper deck, and from the anchor-bed threw himself into the sea.

At the moment, the ship settled down in the water, only the fore-castle remaining above. Espying a floating hammock he got hold of it; and then, climbing on to a floating table, was picked up by cutter No. 2. He had then been for 20 minutes in the water.

G. Nakamura, Sick Berth Attendant :—Had been standing by me, with his face towards the starboard side, when the second explosion knocked him down senseless. Coming to himself, he immediately got up on the boat deck and tried to climb into a boat hanging on the boat davit, when he was sucked into the vortex. Fortunately enough, he took hold of a floating bag, and kept himself on the water, till he was picked up by a boat and taken on board the *Kasagi*. He was also a good swimmer. Scarcely any that did not know how to swim were saved.

The Mental Conditions of the Crew in General and of the Wounded.

After the first naval engagement, the oftener the men got experience of battle, the higher rose their spirits. At the first explosion, they had complete presence of mind, and showed no signs of being “rattled.” They discharged their duties in a most orderly and prompt way.

The second mine blew up the ship’s magazine, and those who were standing near by were almost to a man wounded; most of the survivors being knocked senseless by the shock.

They were not long, however, in recovering their senses, being helped thereto by the shock of the cold water into which they either were thrown or jumped of their own accord. Wounded or unhurt, they were all in the water for from five to twenty-five minutes, yet so great was their discipline that none cried for help, but all waited patiently for the coming of the life-boats for rescue.

As the catastrophe was a most unexpected one, its effect on the minds of the ship’s company, should, as a matter of fact, have been widely different from that of a battle between two hostile squadrons. In the following paragraphs I have noted both mental and bodily disturbances, as they continued to show themselves for several days after the rescue.

— When the crews jumped into the sea, none felt cold or the pain of his

wound; and few became aware of having been injured by seeing their wounds bleeding, after having been rescued by the life-boats, but most of them felt nothing until after they had been received on board the *Tatsuta* or *Kasagi*. I made inquiries among the wounded as to the causes of their wounds; but they mostly knew nothing, and hardly one among them could satisfactorily explain how they felt at the time of explosion. Some few said they felt as if they had had an electric shock; but the majority only said it was like a dream. Nothing would be more just than such a statement; indeed, I could not really frame a definite answer myself. At such a moment, men suffering from the concussion of the shock would either have no sensations at all, or at the best confused ones. A few minutes later consciousness returns with a torrent of jumbled ideas. At least such was my experience.

Most of the survivors of whom I made inquiry suffered for a few days after their rescue, from want of appetite, low spirits, and sleeplessness; they had uneasiness in body and mind, and would be startled by the slightest sounds and vibrations. Some were so much affected, that even a week after they entered the Naval Hospital at Sasebo, they would still jump at the slightest sound and would spring up from the bed on hearing the midday gun. The above three symptoms were so prevalent that they might be considered as symptoms common to all the wounded. The feeling of horror, like other feelings, greatly depends upon one's constitution and temperament; and though, in this respect, there was no great difference between the hurt and unhurt, yet the former seemed to feel it more intensely than did the latter. Some men vomited after being picked up; I myself dimly recollect that I vomited twice or thrice in the boat. Some felt a burning thirst and drank water endlessly; others had a headache for a day or two. It may be presumed that the headache was mainly due to cerebral anaemia; the thirst was not the result of bleeding, but was chiefly due to fatigue and the swallowing of salt water; and the vomiting was due to irritation of the mucous membrane of the alimental canal caused by taking in large quantities of sea-water and to concussion of the brain.

There were few of the survivors, who had not swallowed at least one mouthful of salt water. There was, therefore, no remarkable difference between the

wounded and the not wounded, as far as the above-mentioned symptoms were concerned.

As I observed before, the mental condition of the men mostly remained unchanged until they jumped into the sea. Some were collected enough to begin handling an oar immediately after having been picked up on the life-boat; not a few, however, remained dazed and absent minded for a time. All recovered naturally without any special treatment, and when they were taken on board the two ships, few seemed to bear any special traces of the sufferings they had endured. The only noticeable feature was the horror, which I have already mentioned; but none had any lasting ill consequence recognizable in their mental condition.

I could not make inquiry of all the wounded that were suffering from shock; but so far as I did so, I found that the most numerous cases occurred among those who were in the stern of the ship; fewer among those amidships; and none in the fore part: which shows that the more distant the men were from the place where the explosion took place, the more weak was the shaking. The wounds of the survivors were all light; shock seems therefore to have no connection with the severity of the wound.

The amount of bleeding and the cleanliness of the surface of wounds at the moment when they were picked up, could not be clearly ascertained; but it seems that the bleeding was generally not profuse. If we look at the courses of wounds on board the *Fukuoka Maru*, it may be inferred that the perfect aseptic treatment adopted was not much influenced by the fact that the wounds were dipped when quite fresh in the salt water.

As to the pain, many felt it only after a few hours, on board the ship they had been taken on to. It was generally very slight degree; indeed in cases of contusion, some felt nothing till the next day. Among the wounded (excluding cases of immediate death), contusions, contused wounds, abraded wounds and burns were the most frequent. Causes were for the most part unknown. The injuries seem to have been due to flying splinters of iron or wood, to heavy articles, such as spars falling on the deck from above, to striking against hard substances in jumping into the sea, or to being jammed against the gunwale of

the life-boat while being rescued. But certain conclusions could be drawn only in a minority of cases. The burns of course would be due to the explosion of powder. Other classes of wounds were extremely rare: of fracture of bones, there were only two cases—the one fracture of finger, the other a doubtful case of rib fracture.

Thus the wounds of the survivors were fortunately of slight character and had no distressing aspects when compared with those caused by shells, but how complicated and how disastrous the wounds in the cases of immediate death were may be easily imagined. Explosion wounds, severe burns, even mutilation of the whole body, etc., were most frequent. In most cases, death, by shock or drowning, was probably instantaneous.

Report on the Relief of the Survivors of the *Heiyen*.

By Surgeon K. Sakaino, Chief Medical Officer of the *Saiyen*.

On the 9th of September, the *Heiyen* joined our division. As she had comparatively powerful guns, we entertained great hopes of her; we were with her steaming off Louisa Bay, and keeping strict guard and watch. On the 18th the *Saiyen* was at Hudson Point; the *Heiyen*, on lookout duty, was on her way to Louisa Bay. About 7 p.m., she was observed to turn towards the north and steam in that direction keeping Iron Island to the east. At 7.45, she was lost to sight being shut off by the island. Towards the evening, the wind blew violently and incessantly; and the *Saiyen*, wishing to change her moorings, weighed anchor at 11.50 p.m. off Hudson Point, and anchored the next day, at 1.32 a.m., off Murchison Island. On the following morning, the *Heiyen* had not yet put in an appearance. At 8.32 a.m., we weighed anchor again and steamed to the north near Tung-kia-kao, searching for her, but in vain. At 12.20 p.m. we reached Louisa Bay, but still no traces of the *Heiyen*. Ultimately, at the close of the second bombardment in co-operation with the third Army, we found, two miles off Reef Island, a boat with a dead body in it. The body was partially naked, but on the under-belt there was the mark S. Ogawa, "8612, Yokosuka, Volunteer;" and the boat belonged to the *Heiyen*. Also, we found a skylight and some hammocks floating about near by, and concluded that the *Heiyen* had sunk somewhere not far off. But the sea was

running high, and the sun was near setting. We therefore stopped our search at 6.02 p.m., and at 8.47 arrived with the *Akagi* at Murchison Island.

The corpse was subjected to a preliminary examination, and placed in a chest on the upper deck. As soon as we had anchored, we took it out again, shaved off a portion of the hair for transmission home, sprinkled it with carbolic acid solution, wrapped it in a blanket, laid it back again in the chest, and waited for the next morning.

The morning on the 20th dawned still with the same heavy seas as on the previous evening, and as we had to search for the *Heiyen*, a burial on shore (a cremation of the body) was entirely out of the question. So the funeral took place at the anchorage at Murchison Island. The body was wrapped in a couple of red blankets, one of the amulets was placed on his chest, and the whole was sewn in a hammock. About 8 *kan* of shot was fastened to his feet. At 10.30 a.m., before the whole ship's company mustered for the purpose, the dead man was committed to the deep, feet first, from the quarter deck. The belt, the remaining amulets and the locks of hair were kept to be sent to his home.

At 12.30 p.m., we left the island, and were steaming towards Louisi Bay. We were exposed to much danger, for we rifled three mechanical mines floating near Hudson Point, and were engaged with the converted gunboat *Mukojura Maru* in searching for the *Heiyen*.

A little past four in the afternoon, we received from our consort the information that they saw on Reef Island something that looked very like cast-aways. Hereupon, I ordered the ship's cook to make some rice-gruel, and at 4.55, I started for Reef Island in a boat which was towed for some distance by the gunboat. Hagiwara, our Second Sick Berth Steward was with me, and we took along with us a nurse's emergency bag, seven blankets, two bottles of wine, one of brandy, three canteens containing each half a *sho* of cream dissolved in water, and one canteen of water. When the boat approached the island, we saw a few men on the top of a hill, who waved signals and directed us to a safe place of landing. The sight filled us with joy: we took to the oars, and casting off from the gunboat, changed our course to the windward, and in a short time ran into a little inlet, where the water was deep and calm. No sooner had the boat

approached shore, than down came the castaways. These were only four of them, wrapt in blankets or wearing just their shirts. It was a touching sight. Before the boat touched the shore, they wanted to jump into her; but we prevented them from doing so, until we had reached a safe mooring. This was at 6.20 p.m. Then our boat again taken in tow by the gunboat, at 7.17 we reached our ship; examined the men in the sick-bay, gave them clothing, fed them with rice-gruel and eggs, and put them to bed in the sick-bay without asking them any questions.

As soon as the boat got back, our ship started for her anchorage, and arrived at Murchison Island at 9.50 p.m.

Below I give the names of the rescued, the treatment given them and their own statements, etc.

(1) Survivors's Names, Ranks, Wounds and Treatment at the Time of being taken on Board.

K. Komatsu, Chief Petty Officer:—He had abrasions on his hips, thighs and legs, which were already dried up and had no symptoms of suppuration; he was wearing a shirt of cotton-crêpe, an under-belt and drawers.

T. Mogi, Chief Stoker Petty Officer:—He had abrasions on his thighs and a contused wound on the left chest, but they were very slight and needed no treatment; he was wearing an overall suit and stockings.

K. Tomatsu, Ordinary Seaman:—He had a contused wound of the right small finger, and an incised wound 1 c.m. long on the plantar side of the ungual phalanx of the right great toe and an abrasion on the internal malleolus; he was wearing a shirt, trousers and a working rig coat.

J. Tanaka, Cook:—He had only slight abrasions on both arms and feet, which were already dried up; he was wearing a shirt and a working rig.

All four complained of a dull pain at the waist and in the back. Abrasions appeared in long parallel lines, as though they had been brushed in. These, it is supposed, were caused by knocking against the rocks on the shore of Reef Island. Mogi's contusion on the chest was due to the friction of the hammock which he was holding in his arms, while floating.

(2) Conditions at the Time when received on the Boat.

All four had a very healthy appearance, and did not seem to be fatigued; they were slightly wounded in hands and legs, none needed the immediate treatment. They drank a few cups of diluted cream and the wine we had brought for them with much gusto, taking about 3 *go* of the former and about one of the latter in the hour which elapsed before their return to the ship. We gave them seven of blanket, to which were added four more borrowed from our consort; and thus they could wrap themselves up in three blankets each.

(3) Their Statements.

The Statement of K. Komatsu:—"At about 7.40 p.m. on the 18th, the *Heiyen* left her post on guard duty, and when about a mile and a half south-west of Iron Island, struck a mine and sank. The explosion threw those on the upper deck high up in the air. I was, at the time, reading a news-paper in a store room on the lower deck, when the electric light went out, and the place became filled with steam. I went in haste to the upper deck, but rain and wind were violent and there was a thick darkness, so that I could see nothing, though I heard the voices of men. Then the ship heeled to starboard and began to sink from the stern; so I made a desperate jump into the sea from the starboard side. Soon after, the starboard davit came down on me, followed by that on the port side, but I succeeded with difficulty in avoiding both. I saw several men crowding about the keel of a boat that had capsized, on skylights, etc.; but I knew it was impossible to escape by such means, and caught hold of something that came by me, which resembled the flap of a door, on which I floated at the mercy of tide and wave. I was inclined to despair when I saw I was drifting in the direction of the Lao-tieh-shan Channel; but shortly afterwards the course of tide changed, and I was carried toward Reef Island. I came drifting among rocks, and fearing that I might strike against them and be broken to pieces, I made an effort to land between the rocks, in which I succeeded after an hour's labour. It was, I think, about 1 or 2 a.m., on the 19th that, after about six hours' floating, reached the land, I immediately began collecting grass and laid myself down on it in my wet shirt. I could not sleep all night, but I did not feel any great pain."

The Statement of T. Mogi:—"At the time of the explosion, I was on watch

in the engine room. The sea-water suddenly flooded in from the starboard engine room and in a few minutes reached above the light of the lower deck; which was already full of steam, the steam pipes being broken. When the signal to "stop" was made from the bridge, I closed the valve and climbed up on the upper deck pursued by the water which was pouring in. As a last resort, I jumped into the sea, and seizing a floating hammock in the left arm and with the right following the tide, arrived at Reef Island in about five hours. My joy was great, when my feet touched the sandy bottom, and I crept on shore, where I waited for the break of the day."

The Statement of K. Tomatsu:—"I had just reached the fore galley for the purpose of spinning a yarn with my mates, when the explosion took place. I ran up on the upper deck, but was thrown into the sea, and sinking twice deep into the water. I rose with difficulty to the surface and took hold of a spar. I could hear the cries of men; and perceived that some were clinging to hammocks, biscuit cases, whilst others were trusting themselves to a skylight. Together with T. Ishida, an ordinary seaman, and Tokida, a stoker, I took hold of the shoreboard of a boat floating by us; and after having drifted for about two hours, the wind changed and we were driven to Reef Island. I saw the other two men for the last time at a distance of four or five *ken* from the shore, but not again. In the night, after the moon had set, I reached the rocks; but not being able to stand, I passed the night there, and the next morning met Chief Stoker Petty Officer Mogi."

The Statement of J. Tanaka—"While conversing in front of the warrant officers' mess, I heard the explosion and got up from the second hatch to the upper deck. The electric light was out, and steam was escaping from broken pipes. A boat was half lowered, but it was overfilled with men and still worse with water. I saw the junior navigator making signs to me, but knowing the impossibility of getting in, I jumped into the sea with nothing to take hold of. Itakura, a sick berth steward, Ikejima, an able seaman and I took hold of the shoreboard of a boat and tried to go to Iron Island; but finding this impossible, the wind being against us, we made for Reef Island, which one seaman had already reached. The sea being high, I swallowed much water and was much

inconvenienced; but a hammock coming floating near me, I seized hold of it and was driven to the southern end of the island among many rocks. I could hear human voices upon the rocks, but to reach the shore I had to swim still further. The moon had already set. I cried out for help, but no reply came. The whole of that night I hid myself among the rocks. About 10 a.m. the next day, I reached the shore and joined the others."

Putting the above statements together we come to the conclusion, that while on her guard duty off Louisa Bay, on September 18, at about 7.40 p.m. the *Heiyeu* struck a mechanical mine a mile and a half south-west of Iron Island and sank in about four minutes. It was a dark and stormy night; no one was on the upper deck, except those who were on watch. The hammocks were already down; the men rushed to the starboard side of the upper deck and jumped into the sea; of the whole crew amounting to about 200 men, only four were saved, who all could well swim. There must have been many who could not get on to the upper deck; those who jumped into the sea, but took hold of large skylights, wooden splinters, etc., or who trusted themselves in boats and the like, were, it seems, upset or driven further and further away owing to the difficulty of managing the rudders; or intending to land on Iron Island which was nearer but being to windward, could not attain their purpose.

The four survivors were all floating in the water for about five or six hours, they trusted themselves to doors, hammocks, boards, etc., and did no more than just steer with one hand, without losing their presence of mind. They all were often seized with cramp in the calf, but soon recovered; they said that, owing possibly to the tide, they felt the sea-water to be now warm and then cold; and that, though on Iron Island and Reef Island there were high hills, the waves were so high that they could not always make out their positions.

It was about 10 in the forenoon of the 19th that the four men met one another. Then they ascended to the top of a hill and called to or made signals for a converted gunboat that was cruising near, but were not discovered. However, on the evening of the 20th, seeing another converted gunboat steam by with a boat of our ship in tow, they made signals to her, pointing out, as above mentioned, where the water was calm for landing. When they perceived that their

signalling had been received and understood, they felt as if they came to life again.

After the evening meal on the 18th, they had nothing to eat, but did not feel much hunger till noon on the 20th, when the hunger and cold became beyond endurance. They went down to the beach, where each ate some twenty shell fish resembling mudsnails, and felt much refreshed.

On the 19th, they searched for water and found a spring falling down a precipice. Their clothes were wet, but they wore them as they were, and the heat of their bodies soon dried them. One of the hammocks was washed away and lost, but another was picked up: they had only two blankets, and a jacket was washed ashore, which was very acceptable. According to the survivors, five dead bodies were driven on to the northern shore of Reef Island; but for some time the sea was too rough for us to go after them.

Besides the above-mentioned survivors, there escaped from the calamity Sub-Lieutenant Nakamura, and eight petty officers and men under him, who had been despatched to Pigeon Bay on picket duty.

We here append the weather table of the *Saiyū* the 18th to 20th. The weather can not have been much different on Reef Island, which is a small uninhabited island lying between Iron island and Lao-tieh-shan promontory.

Sept.			18th	19th	20th
Weather	{	a. m.	Rainy.	Overcast.	Overcast.
		m.	Overcast.	Gale.	Gale.
		p. m.	Stormy.		
Atmospheric Pressure at Noon. (Inches.)			29.93	29.99	29.80
Air Temp- erature (°F.)	a.m.	4 o'clock	76	73	70
		8 o'clock	74	66	69
		12 o'clock	73	71	74

Sept.			18th	19th	20th
		4 o'clock	73	71	74
	p.m.	8 o'clock	70	60	64
		12 o'clock	67	67	62
Dry Bulb Thermometer at Noon (°F.)			71	69	69
Wet Bulb Thermometer at Noon (°F.)			68	62	61
Most Prevalent Direction of Wind			N. W.	N.	W.
Strength of Wind			1-6	2-4	2-7
Locality			Between Louisa Bay and Murchison Island		

N. B.—About 8 p.m. on the 18th, or at the time of the accident: the temperature of the sea-water was 70° F.; the direction of wind N-N-E; the strength of wind five; the tide flowing to the N-E and its velocity about three knots.

Report on the Sinking of the *Saiyen*.

By Surgeon K. Sakaino, Chief Medical Officer to the *Saiyen*.

On November 30, 1904, at 2.24 p.m., the *Saiyen* was slowly moving off St. Abb's Head for the purpose of assisting the land operations against Metre Range, when she ran on a mechanical mine. The captain immediately ordered the water-tight doors to be closed, and endeavoured to ran her aground. In spite of all efforts, however, the water rushed into the ship with tremendous force, so that she began to sink. Orders were given for the crew to abandon her, and a few minutes later she sank. The following is a description of what happened.

1. The Weather :—The sky was overcast in the morning, with a strong gale blowing and a heavy swell, and the water was yellowish. According to observations made on the converted gunboat *Kōryō Maru* at 2. p.m., the records were as follows :—

Weather	clear
Air temperature (°F)	48
Atmospheric pressure (Inches).....	30.20

Dry bulb thermometer	unknown
Wet bulb thermometer	unknown
Temperature of the sea-water (°F.)	57
Strength of wind.....	1-2
Direction of wind.....	west.

2. The Complement and Patients:—The complement on the day when the disastrous event took place consisted of twenty-two officers, 205 petty-officers and men, and six civilian employés as domestics, amounting to 233 in all; besides, there were nine patients, among whom a case was under rest, who was saved.

3. From the Sinking till the Rescue:—The calamity happened when men were not at work, and most of them were on the lower deck. They knew by the explosion and shaking that the ship had struck a mechanical mine; and all endeavoured to get up on the upper deck. Those who had been in the stern soon came out of the third hatch; but those who were in the first compartment of the fore part, were warned off by some one who had seen the smoke and leakage in the second hatch, and so did not come to that hatch, but endeavoured to come to the first hatch, or the hatch of the first compartment, which was at the time closed with the cover, through which they tried to break but in vain. A petty officer seeing this and hoping for good luck, came to the second hatch and running through the pouring water reached the upper deck and was saved. This story was told by the petty officer himself; and throws light on the manner of death of those in the first compartment. Of those who were at work in the boiler room, nothing is known; but certainly they sank with the ship. Hagiwara, the sick berth steward, and two others were in the bathroom, and hearing the explosion, pushed at the door, but as it did not yield easily, they kicked it open and thus barely escaped. They were, however, all drowned, except a seaman, who afterwards stated that the men were naked at the time, that they had just come out of a hot bath, and that they were probably frozen to death.

When the explosion was heard, but before the ship began to sink, a few of the crew jumped into the sea; for they had heard tell of ships that had met with the same fate which in their sinking caused large eddies, into which many

were sucked, never to come up again. Howbeit, when our ship sank, there was no such vortex.

One man who was watching on the top felt the explosion and shaking, came down at once and was rescued; had he stayed there a little longer, he would have been thrown into the sea by the heeling of the ship. That there was a comparatively large number of killed among those who were on and near the bridge, was, it seems, due to the fact that, being near the funnel, they were in a position where they could easily be sucked in. The captain sank with the ship, and no one saw his bright face again. Most of the crew got into the boats which were on the davits on both sides of the ship; the number of these men is not known, but the boats were full of them. The rest jumped into the sea from either side, generally carrying nothing with them. I got on the quarter deck, and seeing a sick berth attendant, Nakagawa by name, coming with a patient ready to get into a boat on the starboard side, I quickly told Nakagawa to call the latter, advising him to take a hammock, and jump into the sea, for a boat might be upset, whilst I believed a hammock would be sure to float—moreover, as the consorts were at hand, the chances of being rescued were considerable. My counsel was no good, for the two boats attained their end; but fortunately, the patient was also saved, and without taking any harm, recovered in a short time.

The men who attempted to take out and manage cutter No. 1 stowed between booms failed in their attempt, and were either wounded or killed.

Those who threw themselves into the water floated on hammocks, barrels, and other wooden spars, waiting for the coming of a life-boat. The enemy, it was said, fired on these unfortunates. I jumped into the water with a hammock under one arm, and once went deep down. On coming up, however, the next moment, I found myself pressed against one of the screws. The next minute, the ship went to the bottom. My hands and fingers were then almost paralysed from cold, in consequence of which I could not shift the arm that held the hammock, though I desired to do so. I only endeavoured to keep myself floating.

Before this time, the *Akagi* and *Koryo Maru*, perceiving the strange smokes curling up from our ship, knew that she had struck a mine; and steaming quickly to the scene of the disaster, lowered boats and barges as soon as possible, and

made every effort to rescue the survivors. The result, thank God, was that a comparatively large number of men were saved. Had the ship been alone or had it happened at night when the catastrophe could not be seen from afar, the result would have been much more disastrous. The cold would also have prevented hopes of floating till rescued. Of those who were picked up, the first were rescued in about four or five minutes by boats of our ship; the latest took an hour. The event took place at 2.24; the last life-boat of the *Akagi* came back, it is said, at 3.45, and that of the *Koryo Maru* at 3.25. Until it became quite dark, steamboats were diligently searching after the survivors.

4. The State when Rescued:—According to my own experience, it may have been due to the rapid loss of bodily heat, I felt intensely cold when picked up, and could not help trembling and shivering for a time; I could not speak distinctly; my hands and legs were paralyzed; and I was drawn up on board the gunboat, by a rope tied round my body. No one in the boat was so much exhausted; all the rest were able to climb the Jacob's ladder. About the administration of urgent measures to those rescued and to me, I only heard the next morning. The wet rigs were taken off and new ones distributed to the survivors on the respective ships, on board of which they were taken when picked up. The officers picked up were lent clothes belonging to their comrades on the consort ships. None of them, therefore, suffered any inconvenience with regard to clothing.

5. The Wounded and Drowned:—Those who were rescued numbered 195 men in all; besides, there were three dead bodies, two who died after being picked up and thirty-three whose bodies were not found.

There were twenty-nine wounded; of which, nineteen cases were contusion; five contused wounds; two incised wounds; one sprain; one punctured wound; one foreign body in the external auditory meatus. Two cases, the one a contusion on the chest and shoulder blades, the other one on the waist and right thigh, were sent to a hospital; but all the rest being only slightly wounded, recovered in from two to eighteen days by treatment on board.

6. The Mental Conditions of the Rescued:—Generally the men were excited, but no one suffered from sleeplessness that night: when the assistant surgeon on

board visited them the same night, he found they were sound asleep and some were even snoring. On the contrary, the officers could not sleep at night: they say that many thoughts came into their minds, and they did not feel sleepy at all; but from the second night, they slept as well as usual.

Though I did not make any minute examination, many seemed to have suffered slightly impaired hearing.

7. Observations:—A. In suspicious localities where mines may have been laid or are often met with floating, it is dangerous to go alone: in the present case, but for the gunboat *Akagi* our consort, we should have had the same fate as those on the *Heiyen*.

B. To jump naked in winter into the water is not good; it is the experience of a sub-lieutenant that, as he wore a flannel shirt and drawers, he did not feel cold so intensely, for the water did not soak in, for a while. Theoretically, it is a self-evident fact, that a naked man with his skin in direct contact with cold flowing water, loses his bodily heat in a much shorter time, than one who is fully clothed and therefore touches the flowing water only indirectly. Much more is this the case, when a man is picked up out of the water and exposed to a merciless wind.

C. For floating purposes there is nothing better than a hammock. Whether it is better to take a hammock under one's arm or to hold the extremities by extending both hands lengthwise along it, cannot be decided here; but in winter, no way is left but just to put only the head out of the water and to embrace the hammock, for otherwise the body would soon be frozen, and paralyzed, so that one would soon find it impossible to keep a firm hold of the hammock. To let go the hammock then means drowning. There is an instance, in which the cord, with which the hammock was lashed up, began to loosen of itself, and the water soaking, it sank, carrying an almost frozen man with it. It is advisable, if one has the time, to examine how the hammock is lashed. It is said also that, if one holds it with the seam downwards, it floats better; but it is not known in general how long it can float. Other objects as substitutes for the life-buoy so familiar to men's minds, such as barrels, breakers, etc. are utterly useless: they are not stable and roll round, the head instantly sinks under the water,

and the men who trust themselves to these articles end by being drowned at last.

D. It is needless to say that on such an occasion one should preserve presence of mind as much as possible; and though a man may be skillful in swimming, it is better not to swim: one should be satisfied to keep the head or the nose and mouth above the surface of the water.

E. When one jumps into the sea on such an occasion, it is better not to separate from others more than one can help: the life-boats usually steer towards the places where the men are the thickest, and a solitary swimmer is often overlooked.

F. One should take care not to become overjoyed, or to relax one's exertion at the sight of a life-boat or even just at a side of it. There was a fatal example of a man, who, on getting near to a life-boat, let go the hammock which he had been holding, and sank without hope of being rescued.

Report on the Relief of the Survivors of the Sunken Warship *Takasago*.

By Surgeon S. Kusaka, Chief Medical Officer of the *Otowa*.

It was on December 12, 1904, after sunset, that the *Otowa* on watch off Port Arthur, in company with the *Takasago*, perceived on a sudden at about 11.50 p.m. flashes of a searchlight coming from her consort, amidst the darkness of the night. At three minutes past midnight, we received a wireless message, "Struck mechanical mine, come at once," and went at full speed to help. At a quarter to one, the searchlights of the *Takasago* were extinguished; and we could see only the twinkling of her side lights above the surface of the sea. At 1.08, the beams of our searchlights showed us that the *Takasago* already had a heavy list and was just going to sink. A pinnace, two cutters and two barges were lowered at once and sent to pick up the survivors. Soon after this the vessel sank. On the water, our searchlights showed us crowds of struggling men: it was a dismal scene and the cries for help brought us by the wind were very touching. The life-boats hunted everywhere for survivors with the help of our searchlights, and when a boat was full, it returned to the ship and started again for the work of rescue. We made every possible effort to pick up all the survivors, each boat plying at least twice or thrice between the ship and the

place of the wreck.

Of the survivors of the *Takasago* only a very few saved themselves by means of floating objects such as spars, timbers, hammocks, etc. The temperature of the air was 32° F. and that of the sea-water 47° F.; the north wind blew strong and its strength measured four; the sea was high, and it was snowing; the management of the boats was extremely difficult and the actions of the crew were much hampered. Thus it happened more than once that though the boat approached quite close to a drowning man, it failed to accomplish its purpose of rescue by reason of the waves. It often occurred, too, that the man seized hold of an outstretched oar, and was being pulled in slowly, when, at the moment he came within reach of the gunwale, he let go his hold and sank. Even those whom we had the good fortune to save were only got in to the boats with great difficulty. In the pinnace especially, the sides of which were high, the difficulty was very great and took a long time to pick up a drowning man: the work was much easier with the shore boats, the sides of which were much lower. Even when the man picked up had to be removed from the boat to the ship, the waves broke against the ship, and the boat was tossed up and down, making it almost dangerous to come alongside of the ship. Moreover, being compelled to work under lamp light on the darkest of nights, nothing went well. The men were taken up one by one with a whip and a net as far as the deck, and it often took much time and labour to rescue even a single case. After we had been engaged in the work of rescue for about thirty minutes, the surface of the sea became still again, and we heard no more cries. We stopped searching at 4.42 a.m.

Arrangements for Receiving the Saved:—On the 13th, at 12.40 a.m., I arranged the receiving places as follows:—

a. For the Healthy: The warmer passage around the engine and boiler rooms on the lower deck amidships;

b. For the Severely Wounded: The compartment near the sick bay on the lower deck;

c. For the Slightly Wounded: The compartment, astern of the sick bay on the lower deck.

With Assistant Surgeon K. Horii, to help me, I directed the sick berth

staff, made arrangements in the operating room and finished all my preparations for the treatment of wounds. At the same time, for the use and comfort of the sufferers, 300 blankets were distributed to the sufferers; hot grog and warm rice-gruel were doled out before the sick bay; and having settled the distribution of the medical staff, we were waiting for the arrival of the picked-up men. Soon we received thirty-seven men from the boats of the *Takasago*.

Receiving the Sufferers:—The first to be taken on board (from a cutter of the *Takasago* at 1.25 a.m.) were Fleet Engineer R. Morinaga, Paymaster S. Saito, with two officers and ten men. The boat had been stove in by contact with one of the side-guns of the *Takasago*, had sprung a leak, and lost all its oars except two, and the crew were all baling out water. They reached the ship with great difficulty. However, the time during which they were exposed to the cold was short, and no one was frozen.

Another cutter of the *Takasago*, which came in a few minutes later, had on board about twenty. The boat being uninjured, all were safe and sound, among them two patients under rest. One of the latter had had his periproctitis operated on, and escaped in his sick gown. The fact that at the sinking of the *Takasago*, while none of the nursing staff escaped, the patients under rest did so nevertheless, shows that the medical staff of the ship worthily fulfilled its duty. It may be supposed that at the calamity, they first of all took measures for saving the patients, and afterwards returned to their posts and were at work at their appointed places, when they sank with the ship, before they had time to get up on the upper deck: the statement, that none of the rescued, while floating in the water, saw Surgeon H. Inagaki or any of the nursing staff, may be taken as a sufficient proof of this.

Those who were received at the third trip and subsequently, were about 130 in all. They had been rescued by the boats of our ship and barges. Among these were Captain H. Ishibashi, Lieutenant-Commander K. Ogura, Staff Surgeon T. Kano with three other officers.

Urgent Measures of Relief taken.

1. Those who had neither been wounded nor frozen had their wet clothes taken off and were given a pair of blankets each and hot grog provided for them

in front of the sick bay. After this, the new clothing kept in store on board the ship was distributed among them.

2. Those who were suffering from the effects of intense cold locally or constitutionally, but only in a slight degree, were first stripped of their wet clothes and wrapped in blankets given; the wounded were sent to the operating room; and the frozen were received in the compartment astern of the sick bay and treated as follows.

a. Treatment of the Wounded:—Most of the slightly wounded had contusions or contused wounds of hands and legs, but none had profuse bleeding. As the rescued persons, whether wounded or not, were crowding into the receiving quarters, only temporary measures of relief were given to the slightly wounded, minute examination and antiseptic dressing being postponed, until the treatment of more serious cases had been finished.

b. For those suffering from the constitutional effects of cold, resulting in impaired functions of sensory nerves, and to some extent, of thought, though not yet wholly unconscious, special treatment was given in strict agreement with the therapeutic laws laid down for the treatment of these cases, not to apply heat to the patient too hastily. We began by separating them from those not affected in this way, and brought them on the lower deck astern, a place colder than the location assigned to the healthy survivors. We gave them a small quantity of brandy, rubbed them all over with cold wet cloths and then with blankets, until they had entirely recovered their senses. After recovery they were removed to the warmer quarters. These patients numbered twelve in all, and the above treatment took about half an hour for each. The result of the treatment was, however, most satisfactory.

3. The more serious cases engaged our almost entire attention. In bringing them to the receiving quarters below, the round-about and slow methods of conveyance by stretcher were given up; they were all conveyed by hand. As quickness is life on such occasions, no moment was to be lost. The men were taken as quickly as possible to the temporary hospital below, their wet clothing was taken off, they were laid on their faces each with a small cushion just under his stomach, and by pressure applied on their backs, the swallowed water was

forcibly vomited out. Then they were turned on their backs, and their nostrils and mouths were cleansed from any foreign bodies that might cause obstruction to the free passage of air to the wind pipe. The cushions were then placed under the shoulder blades and every effort made to restore the natural breathing.

Along with these treatments, camphorated ether was administered hypodermically, the whole body was once more rubbed with wet cloth, the breast was tapped with the same, the body was once more rubbed with dry woollen cloth; the part below the chest was wrapped up warmly, hot water bottles and the like were placed between the thighs, etc.; and then artificial breathing was continued for much more than an hour, till the whole nursing staff and other operators had become thoroughly exhausted. No efforts now remained untried for their recovery. In spite of everything, nine could not be brought back.

Observations:—After the experience of the present case, I think it most convenient in such a case to use boats with low sides as life-boats. In a pinnace or such like boat, on account of the high gunwale, great difficulties are encountered and much time is wasted in picking up the shipwrecked. On the other hand, the shore boats of Japanese style, were found most convenient for the purpose; moreover, the space on board being comparatively wider than on boats of foreign build, much more liberty was enjoyed after the shipwrecked men had been picked up.

In the life-boat, it is most important to have as many blankets and overcoats as possible. If the men picked up could have thrown their wet clothes off in the boat, and been wrapped up with blankets and thick overcoats, the results of the treatment given would have been much more favourable. For instance, Assistant Engineer M. Katsumoto did not feel much cold so long as he was in the water; but on being picked by the life-boat, he began to feel intense cold, so that he could not keep from shivering and trembling. A few minutes later, as soon as he had taken off his wet clothes and wrapped himself warm in a thick overcoat, he felt quite recovered. This was due to the fact that as the temperature of the air is considerably lower than that of the water, the loss of bodily heat suddenly became excessive. It is probable also that while he was in the water, there was always some muscular exertion to be made, and consequently heat was

always being generated even though in small quantities, and that thus the warmth of the body was kept up better than it would have been with the body at rest. As the air temperature that night was 32° F., and that of the sea-water 47° F., the difference between the two was 15°. Therefore, if a man was in the water, the loss of heat was much less than it was when the whole body was wet and being idle in the colder air; for it is true that one can resist an attack of cold in the water much longer than in the air. If, therefore, in the cold season one has to take drowning men, into a boat, etc., it is most advisable to take off their wet clothes and wrap them up warmly as soon as possible.

SECTION VI. THE BATTLE OF THE YELLOW SEA.

On the 10th of August, 1904, our Combined Fleet consisting of the *Mikasa*, *Asahi*, *Fuji*, *Shikishima*, *Kasuga*, *Nisshin*, *Yakumo*, *Asama*, *Kasagi*, *Chitose*, *Takasago*, *Hashidate*, *Matsushima*, *Chinyen*, *Yayeyama*, *Akashi*, *Suma*, *Akitsu-shima*, with torpedo boat destroyers and torpedo boats, fought a battle against Russian Warships *Tsesarvitch*, *Retvisan*, *Pobyeda*, *Peresryet*, *Serastopol*, *Poltava*, *Askold*, *Pallada*, *Diana*, *Norik* and eight destroyers. At 1.15 p.m. the *Mikasa* opened fire, and the first action came to an end at 3.20 p.m. At 5.38 p.m., the engagement was renewed, and at 8 p.m. firing ceased. The *Mikasa* suffered most in casualties, the *Nisshin* next, and then the *Kasuga*, *Yakumo*, *Chinyen*, *Asagiri* and torpedo boat No. 38. According to the reports from the chief surgeons on board the above warships, the *Mikasa* was struck by twenty-two shells; the *Nisshin* and *Kasuga* by five each; the *Asagiri* by two, and the *Chinyen* and *Asahi* sustained much damage from the splinters of shells which exploded on the surface of the water. We subjoin a description of the casualties sustained.

The *Mikasa*:—At the commencement of the battle, a shell perforating the aft shelter deck, exploded against the lower part of the main-mast, killing two bandmasters, a bandsman and a blue-jacket; three seamen and a bandsman died afterwards from their wounds, and Lieutenant S. Ichikawa and six men were also wounded. In the second action, at 5.45 p.m. a 12-in. shell pierced the men's closet on the port side; and exploding in the lamp room, wounded four bandsmen

who were engaged in ambulance work and three others. A few minutes later, a shell hit the upper part of the after funnel; and H. Takatsuji, Midshipman, with two men were wounded. Another shell hit the shield of the No. 16 12-pounder gun and two Sub-Lieutenants I. Shinagawa and S. Hata were killed. At 5.56, a shell hit the aft 12-in. turret and disabled the right gun; and by the explosion gas in the turret, Lieutenant-Commander H.I.H. Prince Hiroyasu Fushimi, and two men were wounded severely, and a warrant officer with ten petty officers and men, slightly, the splinters killing four men and wounding four, on the shelter deck, boat deck, etc. At 6.30, another shell exploded against the sennaphore on the fore bridge and killed Sub-Lieutenant S. Fujise and three men, fatally wounding Lieutenant-Commander K. Uyeda, Signal Boatswain T. Fukuda and two petty officers; and slightly injuring, Captain H. Ijichi, Lieutenant-Commander K. Ogura, Sub-Lieutenant H. Nakazawa, Midshipmen K. Hasegawa and Kato, and nine men. At the same time, a 12-in. shell pierced the crew's sick bay and entered the third compartment on the lower deck, eleven petty officers and men of the fire brigade being killed or wounded. At 7, a 10-in. shell exploded against the No. 14 12-pounder gun mounting, igniting the ammunition in the neighbourhood and on the upper deck close by, killing a midshipman, and wounding six men severely and three slightly. On the main deck, a seaman was killed; Lieutenant-Commander N. Oyama and eleven men were slightly wounded. Three more shells were received; and K. Sakai, a chief warrant officer, and a few others were wounded.

Nisshin:—At 2 o'clock, a 6-in. shell flew across the upper deck and perforated the main-mast; and though it did not burst, the iron and wooden splinters wounded nine men. Then a 10-in. shell fell on the fore bridge, and broke into the chart room; and without bursting, killed Paymaster J. Kurata and a petty officer, and wounded Sub-Lieutenant S. Muramatsu, a midshipman and three signalmen. A 12-in. shell, which struck the after bridge at 7.10, exploded and carried away Engineer Inspector T. Saito, a midshipman, two warrant officers and five men; killed Lieutenant-Commander Y. Takahashi, Lieutenant-Commander N. Matsumoto, Lieutenant T. Yokoyama and one man, and wounded two men.

The *Kasuga*:—In the *Kasuga*, at 6.25, a 6-in. shell piercing into the

ward room pantry and exploding, wounded four men; afterwards, two shells struck No.2 6-in. gun and the flag locker, wounding four petty officers and men.

The *Yakumo* :—She was struck at 3.40 p.m. by a 6-in. shell, which struck her coaling port amidships on the upper deck, starboard; the splinters on the main deck killing a chief carpenter, eight petty officers and a man, and wounding twelve petty officers and men.

Destroyers and Torpedo Boats :—The *Asagiri* of the fourth destroyer division, while attacking the enemy's ships at 10.10 p.m. on August 10, was struck by a 15-c.m. shell on the coal bunker on the port side of the aft boiler room. The boiler exploded and K. Yoshida, a warrant officer, with eight petty officers and men of the engineer branch, were scalded to death. Torpedo boat No. 38 was struck by a fish torpedo; and a seaman was drowned, and Sub-Lieutenant H. Yemori, Chief Petty Officer S. Tagawa, and six men were slightly wounded. Besides these, there were several of the warships and boats on which one or two were wounded. Adding sixteen wounded in the discharge of their duty, quite independently of the hostile fire, the cases of casualties amounted to 226, as shown in the following table.

Division.	Ship, Vessels, or Boats.	Killed on the Spot.	Died on Board.	Died in Hos- pitals.	Invalid ed from Service.	Recover- ed in Hos- pitals.	Recover- ed on Board.	Total.
1st Division.	<i>Mikasa</i>	21	11	1	12	35	45	125
	<i>Asahi</i>	—	—	—	—	—	2	2
	<i>Kasuga</i>	—	—	—	3	3	5	11
	<i>Nisshin</i>	13	3	—	3	7	6	32
3rd Division.	<i>Yakumo</i>	8	4	—	3	4	3	22
	<i>Asama</i>	—	—	—	—	—	1	1
	<i>Chitose</i>	—	—	—	—	—	2	2
5th Division.	<i>Chinyen</i>	—	—	—	—	3	3	6
6th Division.	<i>Idzumi</i>	—	—	—	1	—	—	1
4th Division of Destroyers	<i>Asagiri</i>	9	—	—	—	—	—	9
5th Division of Destroyers.	<i>Murakumo</i>	—	—	—	—	—	3	3
1st Flotilla.	No. 67 t. b. ...	—	—	—	—	1	—	1

2nd Flotilla	No. 38 t. b. ...	1	—	—	—	6	2	9
6th „	No. 58 „	—	—	—	—	—	1	1
20th „	No. 65 „	—	—	—	—	—	1	1
Grand Total		52	18	1	22	59	74	226

The Treatment of Killed and Wounded :—On the *Mikasa*, we established the dressing stations in the fifth and seventh compartments amidships on the lower deck ; and these, with the sixth compartment, were used as receiving places for the wounded. Twelve ambulance men were distributed on the upper deck, and eleven on the main deck ; besides these, three petty officers were ordered constantly to visit these two decks during the engagement. The total number of casualties was 125, among whom were included nine ambulance men. Those who received temporary treatment at the dressing stations, while the action was going on, were seventy-five ; of whom forty-two came in to the dressing stations on foot, twenty-nine were carried by hand by the bearers, and four on the Totsuka stretchers. Among the wounded, many were treated on the spot with the help of first-aid packages, by ambulance men or their companions. After the engagement had come to an end, the wounded officers and warrant officers were removed to their own rooms, the midshipmen, to the officers' sick-bay, and the men, to the crew's sick-bay and the ninth and tenth compartments on the lower deck. Their wounds were then redressed in the operating room, the more serious cases receiving the first attention. This careful examination was finished on the next day (the 11th), and, lastly, the corpses were examined. On the morning of the 12th, forty-two wounded were sent to the Hospital Ship *Saikio Maru* ; and the bodies of the killed were cremated on the land.

On the *Nisshin*, they established the fore dressing station abaft of the torpedo-room, on the port side, and the after one forwards of the torpedo room, on the starboard ; and distributed twenty-two ambulance men about the upper and main decks. During the action, when killed and wounded came thick and fast, the ambulance men carried them at once to the dressing stations without stopping to dress their wounds, and for some time, the dressing stations presented a scene of

the greatest animation and bustle. Nothing was applied to the wounds but an antiseptic powder of boracic and salicylic acids mixed, with dressings, and the patients were then laid in quiet places in the passages in the back part on the lower deck, where they waited till the close of the action. All necessary operations were then performed in the operating room, and ten of the wounded were transferred to the *Saikio Maru*, after arrival at the base.

On the *Kasuga*, the surgery on the main deck, and a part of the torpedo tube room in the fore part on the lower deck, starboard, were selected as dressing stations. When men were wounded, the ambulance men distributed about the ship carried them immediately to the aft dressing station; where the medical staff treated them chiefly by the aseptic method, before removing them to the receiving place.

When on the *Yakumo*, twenty-two were killed or wounded at the same time, they were at once carried by hand to the fore and aft dressing stations. There the wounds were dressed; and after nightfall, they were removed to the operating room on the main deck, where the necessary operations were performed.

The wounded on the *Chinyen* were temporarily dressed during the action, and after the battle was over, the necessary operations were performed solely by aseptic methods. The wounded on torpedo boat No. 38 received treatment on the *Fuso* and *Chiyoda*, and on the *Yciko Maru*.

Of the wounded in this engagement, after they had been treated on board their respective ships, sixty-six were, between 11.30 a.m. and 3 p.m. on August 12, removed at the base to the Hospital Ship *Saikio Maru*. Ten of the wounded on the *Chinyen*, *Idzumi* and No. 38 torpedo boat were taken on board the Hospital Ship *Kobe Maru*; and five others were, after a time, sent from the *Mikasa* to the *Saikio Maru* and *Kobe Maru*. The captain of the *Mikasa* recovered with the treatment received on board the ship; after recovery he suffered from neuralgia, and was admitted, on January 3, 1905, to the Naval Hospital at Kure: within a few days he was perfectly restored. The wounded received on the *Saikio Maru* were, on the 14th, removed to the Sasebo Naval Hospital; those on the *Kobe Maru*, were removed to the same hospital on September 20.

SECTION VII. THE BATTLE OF ULSAN.

The warships which took part in the naval battle of Ulsan were the *Idzumo*, *Adzuma*, *Tokiwa*, *Iwate*, *Chihaya*, *Naniwa*, *Takachiho*, *Nitaka*, and *Tsushima* with some torpedo boat flotillas; they opened fire at 5.25 a.m. on August 14, 1904, and stopped at 10.04. The Russian warships *Rossia* and *Gromoboi*, after sustaining heavy damages, escaped to Vladivostock; the *Rurik* was disabled and sunk at 10.30.

The following ships were struck by Russian shells during this engagement viz. the *Idzumo*, *Adzuma*, *Tokiwa*, *Iwate*, *Naniwa* and *Takachiho*. The exact numbers could not be ascertained, but according to the reports of the chief surgeons of the respective ships, the *Idzumo* was struck by twenty shells, five of which produced cases of killed and wounded; the *Adzuma* received ten, three of which produced cases of wounded; the *Tokiwa* received three, one of which produced cases of wounded; the *Iwate* received a shell in the No.1 6-in. gun casemate on the upper deck, the explosion of which killed and wounded seventy-five men at one time; the *Naniwa* was struck by two shells, one of which produced cases of killed and wounded; and the *Takachiho* was struck by a shell.

The Flag-ship *Idzumo*:—At 7.05 a.m. a shell went right through a vedette-boat on the port side; and bursting in a barge, killed a seaman. Thirty-five minutes later another entered at the main deck and exploded in the master-at-arms's office wounding one man severely. At 8.10 a third entered the first compartment on the lower deck and severely wounded a man on the main deck; a fourth at 9.20 pierced the staff officer's cabin, port, and killed a man; a shell which soon after, penetrated into the upper deck through a nett rack, on the port side, wounded two men severely before bursting, and, on bursting, one man slightly.

On the *Adzuma*, a small calibre shell, at about 7 a.m., struck No. 1 steamboat and exploded, wounding a man; after this, an 8-in. shell went right through the ship from the officers' sick berth, port, to the starboard side; and without bursting fell into the water, wounding one man by indirect concussion. At 9.48, an 8-in. shell penetrated into the captain's cabin; and bursting, wounded a hired servant severely and four men slightly.

On the *Tokiwa*, a 6-in. shell which perforated the aft shelter deck, port, without bursting, wounded two civilian employ  s indirectly.

The *Iwate*:—A shell fell at 7 a.m., on the shelter deck with a large angle of descent and exploded in No. 1 6-in. gun casemate on the upper deck; and ignited a number of cartridges piled close by, the 12-pounder gun crew on the shelter deck being smashed to pieces with the gun. Of the No. 1 6-in. gun crew, nothing remained of Lieutenant T. Haraguchi and thirteen men; eighteen were killed on the spot; Sub-Lieutenant M. Noda and six others died a short time after receiving their injuries; of sixteen other wounded, who entered the hospital, two died; and the remaining twenty were treated on board.

The *Naniwa* and *Takachiho*:—On the *Naniwa*, while dealing with the *Rurik*, a 6-in. shell hit the port Hotchkiss gun shield on the fore bridge, at 9.15 a.m. killing two men and wounding four. At about the same time, the *Takachiho* received a shell on her lower deck; two men were wounded severely, and Lieutenant N. Asakawa, Surgeon S. Kazu and seven others slightly.

Besides the above, if we add twenty-five wounded in discharge of the service, irrespective of the hostile fire, the total number of killed and wounded amounts to 135, as shown by the following table:—

Division & Ships.	Killed on the Spot.	Wounded.					Total.
		Died a Short Time after on Board.	Died at Hospitals.	Invalided from Service.	Recovered in Hospitals.	Recovered on Board.	
2nd Division							
<i>Idzumo</i>	2	1	1	3	—	14	21
<i>Adzuma</i>	—	—	—	—	1	7	8
<i>Tokiwa</i>	—	—	—	—	1	2	3
<i>Iwate</i>	32	7	2	2	12	23	78
4th Division							
<i>Naniwa</i>	2	—	—	1	2	6	11
<i>Takachiho</i>	—	—	—	1	2	11	14
Grand Total.	36	8	3	7	18	63	135

The Treatment of the Wounded:—On the *Idzumo*, they established two

dressing stations, fore and aft, on the lower deck, and distributed one half of the ambulance men over several parts of the ship, the rest remaining as reserves in the dressing stations. The bearers were ordered to give first-aid measures for the wounded as instructed, and to carry them to the dressing station. The staff of the latter were to redress their wounds according to the antiseptic method. When there were at one time a large number of killed and wounded on the *Iwate*, the captain told off a part of the guns' crew on the disengaged side and a part of the fire brigade to carry them immediately to the stations during the action. This multitude of the wounded crowding at the dressing stations, kept the medical staff extremely busy for a while. At first only temporary measures according to the aseptic method were resorted to. On the other warships *Adzuma*, *Tokiwa*, *Naniwa* and *Takachiho*, the wounded were comparatively few in number and the treatment presented no difficulty. When the wounded of the crews of the *Rurik* were taken on board our ships, they were treated by the staff of the dressing stations. On the 15th, the second division entered the Harbour of Sasebo, and twenty-one wounded of the division, and five taken from the *Naniwa* and *Takachiho*, together with the Russian patients, were sent to the Naval Hospital at Sasebo. One case more from the *Naniwa* was sent in later, the wounded from our fleet, admitted to the hospital, after this engagement thus amounting to twenty-seven. We must add another admitted January 28, 1905, who was sent to the same hospital with injuries to his ears.

SECTION VIII. THE BATTLE OF THE SEA OF JAPAN.

On 27-28th May, 1905, our Combined Squadron fought a decisive battle against the Second Russian Pacific Squadron. Our Squadron consisted of the four battle-ships, the *Mikasa*, *Shikishima*, *Fuji*, and *Asahi*; the eight armoured cruisers *Idzumo*, *Adzuma*, *Tokiwa*, *Yakumo*, *Asama*, *Iwate*, *Kasuga*, and *Nisshin*; the seven second-class cruisers *Kasagi*, *Chitose*, *Naniwa*, *Takachiho*, *Itsukushima*, *Matsushima* and *Hashidate*; the eight third-class cruisers *Nitaka*, *Otowa*, *Akashi*, *Tsushima*, *Idzumi*, *Chiyoda*, *Suma* and *Akitsushima*; the first-class coast-defence vessel *Chinyen*; the second class coast-defence ship *Fuso*; the third-class coast-defence vessel *Tukao*; the despatch vessels *Tatsuta*, *Chihaya* and *Yayeyama*;

the first-class gunboat *Tsukushi*; the third-class gunboats *Maya*, *Chokai*, and *Uji*—in all amounting to thirty seven warships, with twenty-one torpedo boat destroyers, forty-four torpedo boats; seven converted cruisers; two torpedo depôt-ships; and two converted gunboats. The action was commenced at 2.08 p.m. on May 27, 1905, and fighting ceased in the evening of the next day. The field of action extended from near Okinoshima to the vicinity of Liancourt Rocks and Dagelet Island, between Tsushima and Korea; and the Russian Squadron was almost completely annihilated. To particularize, during the day action of the 27th, the battle-ships *Ost'yabysa*, *Kniaz Suvoroff*, *Borodino*, *Imperator Alexander III.* were sunk; during the night attack, the battle-ship *Navarin* was sunk, and the battle-ship *Sissoi Veliki*, the armoured cruisers *Admiral Nakhimoff* and *Vladimir Monomakh* so severely damaged that they sank the next day. By the day battle of the 28th, the cruiser *Seyet'ana* and the coast-defence vessel *Admiral Oushakoff* were sunk; the remaining battle-ships, *Imperator Nikolai I.* and *Orel*, as well as the coast-defence vessels *General Admiral Apraxin* and *Admiral Senyavin* were captured. The armoured cruiser *Dmitri Donskoi* sank herself; the *Izumrud* went aground and was wrecked after having escaped; the *Aurora*, *Oleg*, and *Zhemchug* ran to Manila and were duly disarmed; five torpedo boat destroyers were sunk, and one, which had Admiral Rozhdestvensky on board, surrendered. The cruiser *Amaz* and two torpedo boat destroyers were the only vessels that arrived at Vladivostok.

Principal Damages and Casualties:—To mention the damages our fleet sustained in this battle. During the day battle of the 27th, the *Asama* was struck by large calibre shells in the stern, and her steering gear being injured, was obliged to leave the fighting line for a while; the *Kasagi* received a shell in her coal bunker and the leak compelled her to seek refuge in Aburatani Bay. Three torpedo boats were sunk during the night's torpedo attack. These were our most considerable losses; but our battleships and armoured and second-class cruisers, with the destroyers and torpedo boats, were struck by many shells; and there were cases of death and wounds on every ship in the fleet. We shall now give a brief synopsis of the principal damages sustained as well as of the casualties on board our ships and vessels.

The *Mikasa*:—At 2.14 p.m. on the 27th, a 12-in. shell dashed into No. 3 starboard 6-in. gun casemate on the upper deck, and exploding in the latter, wounded nine men. This was the first damage the *Mikasa* sustained. At 2.15, a 6-in. shell again pierced the roof in the centre of the same casemate; and exploding in the latter, killed two men, and wounded Lieutenant H. Murakoshi and five men. At 2.20, a 12-in. shell struck the starboard crew's closets on the upper deck, and exploded in the cordage room on the forecastle, broke the shelter deck above it, wounding seventeen on the fore bridge, shelter deck and in the fore conning tower. Commander T. Matsumura was wounded on the right side of the fore bridge, Lieutenant-Commanders Y. Kanno and H. Iida were wounded in the conning tower, and Lieutenant J. Kiyokawa on the fore bridge. At the same time, a 6-in. shell struck against the lower part of the starboard No. 5. 6-in. gun port on the main deck, and exploded, killing a petty officer and slightly wounding fourteen. At 2.55 p.m., a 6-in. shell struck the roof of No. 11 starboard 6-in. gun casemate on the upper deck, and exploding, killed two men, and wounded two severely and three slightly. At 4.15 p.m., a shell perforated the lower part of No. 7 starboard 6-in. gun casemate on the main deck, and exploded in the coal bunkers, killing a petty officer and wounding two men; at 4.20 p.m., a 6-in. shell broke the lower part of the same gun port and injured three men; and at 4.30 p.m., a 6-in. shell struck the side of the gun port, killed one man and wounded another. At 6.25 p.m., a 6-in. shell struck No. 10 port 6-in. gun, killed a petty officer, and wounded Sub-Lieutenant Y. Yasuno severely and a petty officer and five men slightly. At 6.45 p.m., a 12-in. shell broke into the dispensary and wounded a petty officer and a man. Besides, a shell entered No.15 coal bunker, and another flew into the starboard lower deck, astern, and broke the main-top-mast, both causing some injuries to the men. Of all the thirty-one shells which struck the ship, only twelve produced casualties.

The *Shikishima*:—At 3.20 p.m. on the 27th, a 12-in. shell struck the lower part of No. 6 port 6-in. gun casemate on the upper deck, and exploding in the officers' sick bay on the main deck, wrought great havoc in the casemate as well as on the main and lower decks; thus in the casemate, five men were killed, one man was severely wounded and Lieutenant K. Aburatani slightly;

Paymaster T. Kuroda was slightly wounded by the ward room galley and three men by the side of the 12-pounder ammunition hoist; on the main deck two petty officers and four men, messengers, ammunition-carriers and gun crew were killed, and three men wounded; and on the lower deck one man was wounded severely, and four men slightly. At 6.35 p.m., a 12-in. shell struck the fore bridge, by which one man was killed outside the fore turret, and Lieutenant K. Yukihiko fatally wounded inside. On the right side of the turret, Sub-Lieutenant T. Morita was slightly wounded; on the compass bridge, a midshipman and one man severely wounded and another slightly. Two or three others were wounded by splinters of the shells, that fell and exploded on the water near by. In all eleven hostile shells struck the ship, of which three produced thirty-one killed and wounded.

The *Fuji*:—At 2.33 p.m. on the 27th, a 6-in. shell broke into the captain's pantry starboard in the stern; and exploded against the back of the after turret, slightly wounding one man. At 3, a 12-in. shell struck the after turret, exploded therein, and, igniting the ammunition, killed eight men, while a chief-warrant officer and four men were severely wounded and five others slightly. At 3.27 p.m., a shell which hit funnel-casing, without exploding, severely injured a man, and by the flying iron splinters Engineer T. Abe and a man were wounded in the fore boiler room. At 6.10 p.m., a shell struck the conning tower and broke the fore bridge, and without exploding wounded in the conning tower Lieutenant-Commander S. Takahashi and Commander T. Shima, on the compass bridge a midshipman, and by the side of the funnel-casing a man, all indirectly. At 6.40 p.m., a shell, coming from the left side of the No. 6-in. gun on the upper deck, dashed through the captain's spare cabin, and exploded against the after turret, wounding a man in the carpenter's workshop. The total number of shells and shell splinters were eleven of which six produced casualties to the men.

The *Asahi*:—At 2.35 p.m., a 6-in. shell broke No. 8 hatch-coaming, and exploded, wounding two men on the upper and main decks. At 2.40 p.m., a 6-in. shell exploded against No. 13 starboard 12-pounder gun shield on the boat deck, stern, and killed Sub-Lieutenant K. Morishita and five of the gun crew,

wounded a man severely, and Sub-Lieutenant S. Gōda and two men slightly. On the upper deck it killed a rigger, and wounded a messenger boy severely and three ambulance men slightly. At 4.40 p.m., a 12-pounder shell struck the fore shelter deck, exploded and wounded six men on the starboard side on the deck, fatally wounded a petty officer in the conning tower, and slightly injured three others. The shells which hit the ship were eleven in all, of which only three produced cases of killed and wounded.

The *Kasuga*:—At 2.33 p.m. on the 27th, a 12-in. shell exploded, having struck the main rigging in the middle of the upper deck, and caused great damage, by which seven men were killed and two men wounded severely, besides an officer, a midshipman, a petty officer, and seven men slightly. We received two more shells, which, however, caused no injuries to the men.

The *Nisshin*:—At 2.40 p.m. on the 27th, a 12-in. shell blew up the right fore 8-in. gun, greatly damaged the fore bridge, the upper deck, and the main deck, and produced 20 cases of casualties; namely, on the fore bridge, Flag-Commander K. Matsui was killed, and two men were slightly wounded; on the flying bridge, a man was killed and a petty officer wounded; on the upper deck, two men were severely wounded and three men slightly; on the main deck, a petty officer and a civilian employé were killed; two men were severely wounded and four slightly; and in the torpedo room on the lower deck, a petty officer and one man were slightly wounded. At 4.05, a 9-in. shell struck the fore turret and in the conning tower, wounded Vice-Admiral S. Misu severely and Lieutenant-Commander Y. Tanaka and a signalman slightly; in the fore part of the flying bridge, wounded a signal boatswain slightly and a petty officer severely; and on the fore bridge, port, a signalman was wounded. At 7 p.m., a shell which blew up the fore 8-in. gun, starboard, severely wounded a midshipman on the upper bridge, and a petty officer and an assistant paymaster on the fore bridge, and a man on the upper deck; and slightly wounded a petty officer and a man on the flying bridge, and a man on the upper deck. Besides, there were other shells which produced some casualties: a 12-in. shell which pierced into the port coal bunkers, a shell which blew up No. 5 12-pounder gun, one which disabled the left 8-in. gun aft, and some which grazed the main top, etc. The

effective hostile shells on the ship were sixteen, of which eight produced cases of death and wounds.

The *Idzumo* :— At 2.27 p.m. on the 27th, a shell went through the starboard hammock nettings in the middle of the upper deck, and bursting, killed two men of No.5 6-in. gun crew, wounded two men severely, a midshipman and a man slightly, and at the same time wounded two ammunition carriers. At 3.05 p.m., a 12-in. shell perforated the starboard side plating in the stern and burst into the lower deck, wounding on the main deck three men, and on the lower deck a petty officer. At 4.07 p.m., a shell hit a barge on the starboard side; and, without exploding, slightly wounded two men on the upper deck. At 5.18, the splinters of a shell which exploded on the water slightly wounded three men. At 7.10, a 12-in. shell perforated the upper and main decks, and dashed into No. 5 coal bunker, and, without exploding, killed a stoker in the middle boiler room, and wounded one man in the middle and one in the aft boiler-room. The effective shells were five, of which four produced cases of death and wounds.

The *Adzuma* :—At 2.20 p.m. on the 27th, a shell smashed No.7 6-in. gun, and wounded a seaman severely and a petty officer slightly. At 2.25, a 6-in. shell perforated the starboard side on the main deck, and, though it did not explode, killed a messenger boy and slightly wounded an ammunition carrier. At 2.50, a 12-in. shell struck the aft right 8-in. gun; and perforating the upper deck fell overboard without exploding, after wounding a man in the admiral's cabin, a warrant officer in the turret, and two men on the main deck. At 2.55, a 12-in. shell exploded against the upper part of No. 7 6-in. gun casemate; and caused heavy damage to the upper deck starboard in the stern. It killed instantaneously a petty officer and five men, and fatally wounded a man on the same deck; on the after bridge Commander S. Togo was severely wounded, and on the upper bridge a midshipman, a petty officer, and six men were wounded. When at 3.26 p.m. No.8 12-pounder gun on the upper deck amidships exploded, a petty officer was killed, and three men were wounded. At 3.30, a small calibre shell killed a petty officer on the flying bridge. The splinters of a 6-in. shell which came from the starboard at 4.25 p.m., and entering the main deck,

fell overboard without exploding on the water port side, severely wounded a man. The shells which produced cases of death and wounds were seven; but we really received ten more shells.

The *Tokiwa* :—The *Tokiwa*'s damage was of the slightest. At 3.20 p.m., a shell hit No. 12 12-pounder gun at the back part of the main deck, and four men were slightly wounded by shell splinters; ten minutes later, the splinters of a shell which exploded on the surface of the sea, starboard, injured a man, who after a time died.

The *Yakumo* :—At 2.25 p.m. on the 27th, a small calibre shell exploded in a warrant officers' cabin on the main deck, starboard, and wounded a man severely and a petty officer slightly. At 3.15, another small calibre shell hit the fore part of the steamboat on the port side; on the upper deck, a petty officer and a man were killed by the splinters, one man was fatally wounded, and five slightly. Besides these, the *Tokiwa* received seven more shells and the *Yakumo* eight, which however did not produce any casualties.

The *Asama* and the *Iwate* :—At 2.50 the *Asama* was struck by a 12-pounder shell at the fore bridge, and a man was injured. At 3, two 12-in. shells exploded in the captain's provision room, in the stern, starboard; and made numerous holes in the main deck and in the side at the water-line port, so that, owing to the leaks, the ship was obliged for a time to leave the line. At this time, in the captain's cabin, a petty officer, one of the starboard 12-pounder gun crew, were killed; one man was mortally wounded and four severely; a petty officer, one of the crew of the port 12-pounder gun was wounded slightly. At 3.10, a 12-pounder shell hit the rails on the upper deck, starboard, and killed a man, severely wounding two and two slightly. At 3.13, a 6-in. shell hit the paymaster's office on the main deck, and wounded a man severely and Chief Carpenter T. Sakai slightly. The *Asama* received 12 shells in all, and her damage was considerable; but only four of the shells produced casualties among the crews.

As to the *Iwate*, at 2.25 p.m. on the 27th, a 12-c.m. shell pierced into the 5th divisional officer's cabin in the third compartment on the lower deck, and exploded, wounding a petty officer severely and Chief Carpenter Y. Matsuzaki and two men slightly. At 2.30, a 12-in. shell burst into the captain's cabin,

severely wounded a petty officer, and slightly wounded a man and two civilian employés. Another shell, which hit the main-derrick head, wounded a man slightly; beside this, several hostile shells struck the surface of the sea and exploded, the splinters wounding several men. The effective shells were seven in all, of which only four produced cases of death and wounds.

The *Kasagi*, *Chitose*, *Otowa*, and *Niitaka*:—The second class cruisers and other smaller vessels received only few shells as compared with those above mentioned. The *Kasagi* was struck by a 15-c.m. shell at the first compartment on the lower deck port at 3.10 p.m. on the 27th; which, without exploding, wrought havoc in the fore dressing station, and entering into the second compartment, broke the steam-heater there, the splinters wounding one man fatally, two men severely, and Staff Surgeon T. Yokoi, the chief surgeon of the ship, and three others slightly. At 3.30, two men were wounded by splinters of a shell which exploded on the surface of the water. On the *Chitose*, two men were killed, and four wounded, at 4.20 p.m. on the same day. The *Otowa* dealt with the *Svietlana*, and received a shell at her fore bridge at 10.33 a.m., when Sub-Lieutenant K. Miyazaki, a petty officer and one man were killed, one man and a civilian employé were wounded severely, and an assistant paymaster, two petty officers, thirteen men, and an employé slightly. On the same day, while dealing with the *Dmitri Donskoi*, four men were severely wounded at 7.40 p.m., two of whom died a short time after. As to the *Niitaka*, a shell hit the sponson of her No.4 6-in. gun; and exploded against the gun shield, killing a petty officer and wounding two men.

The *Naniwa*, *Takachiho*, *Akashi*, and *Tsushima*:—On the *Naniwa*, a 47 m.m. shell pierced the fore part of the upper deck at 4.05 p.m. on the 27th, and fell into the lower deck without exploding, killing Sub-Lieutenant K. Kotaka, and wounding a petty officer. Another hit the port stern at 5.07. Fortunately it did not explode, but a man was severely wounded by a splinter. At 8.05 on the 28th, while the ship was engaging with the *Dmitri Donskoi* near Dagelet Island, a shell penetrated into the provision room in the stern, port, and injured a man; a warrant officer and four officers and men, who, were in that compartment trying to stop a leak, were suffocated, but soon recovered after treatment. On the *Taka-*

chiho, a man was wounded by a shell which hit her funnel in the battle of the 27th. The *Akashi* received a 12 c.m. shell at the captain's cabin at 5.05 p.m. on the same day. The splinters killed a man, one of the crew of the 47-millimetre gun; two men were wounded fatally, another died in the hospital, and two men were slightly wounded. On the *Tsushima*, a shell hit the main-mast back-stay at 4.55 p.m. on the 27th, and slightly wounded Commander Y. Yamazaki. At 5, a 6-in. shell pierced into the captain's office from the port side, and exploded, killing three men and wounding a man severely and twelve others slightly. Subsequently another 12-c.m. shell, coming in the same way, severely wounded two men who had been slightly wounded before, one of whom died afterward.

The *Hashidate* and the *Idzumi*:—On the *Hashidate* a 15-c.m. shell struck the port No. 6 gun-mounting in the stern at 5.07 p.m. on the 27th, and wounded two men. At 5.09, a shell perforated the side of the ship on the port side directly forward of the port No. 8 12-c.m. gun, and fell overboard without exploding, severely wounding midshipman and two petty officers. On the *Idzumi*, at 4.35 p.m. on the 27th, a civilian employé was killed, and three men were wounded. Ten minutes later, she was struck by a shell at the foretop, and two men were killed.

The Torpedo Boat Destroyers:—The Damage done was comparatively slight as were also the injuries to the men on the destroyers, it being only in the second and fifth divisions that there was a considerable number of casualties. In the first division, during the night attack on the *Dmitri Donskoi* along Dagelet Island, only one man was wounded. The *Oboro*, on board of which was the commandant of the division, received a small calibre shell at her chart room at 8 p.m. on the 27th, and a civilian employé was blown to pieces, a medical officer, a petty officer and two men being wounded. The *Akebono* received six shells from 7.45 to 8.30 p.m. on the same day; and a warrant officer, a petty officer and a man were wounded. On the *Ikadzuchi*, at 8.15 p.m. a shell perforated the starboard coal bunker and dashing into the boiler room through the bunkers from the starboard at 8.15 p.m., broke some steam-pipes, in consequence of which Artificer Engineer Y. Daigushi, as well as two petty officers and four men of the engineer branch were scalded. Another shell hit the port torpedo

tube in the stern at 8.17, and severely wounded Sub-Lieutenant K. Ikeda. A third entered the ward room at 8.18, and slightly wounded the medical officer on board. On the *Usugumo* of the third division, only one man was wounded by a splinter. The *Asashio* of the fourth division received two 12-pounder shells at the ward room, while attacking the *Kniaz Suvoroff* on the 27th; and a petty officer was severely wounded. The *Shiranui*, of the fifth division received a shell at her fore No. 1 boiler, at 3.55 on the 27th; three stokers got scalds, of whom two died the same night. One man was washed overboard and disappeared; and three petty officers and men were wounded. Another shell killed one man and wounded two. On the 28th, while dealing with the *Gromki*, Sub-Lieutenants J. Sakai and M. Sugiura, and three petty officers and men were wounded; moreover, a petty officer who had been wounded on the 27th received another slight wound. Though the *Inadzuma* of the second division, the *Asagiri* and the *Murasame* of the fourth, and the *Murakumo* of the fifth received some shells, there was no case of death or wound; and though the *Ariake* and *Arare* of the first division, the *Shinonome*, *Kasumi*, and *Sazanami* of the third, the *Shirakumo* of the fourth, and the *Yugiri* and *Kagero* of the fifth, engaged along with their consorts in the attack, they received neither shells nor shell-splinters.

The Torpedo Boat Flotillas:—Though the exact number of the shells which the flotillas of torpedo boats received is not known, it is estimated that they amounted to above thirty-three, to which must be added the splinters from the enemy's shells, which exploded on the surface of the sea, and many projectiles from machine guns. The cases of killed and wounded were respectively sixteen and forty-eight for the whole flotillas. To particularise, the leading boat of the first flotilla, torpedo boat No. 69, at 9.05 p.m. on the 27th, came into collision with one of our destroyers, and having been damaged at the bow, sank. Two petty officers were drowned: Lieutenant-Commander M. Fukuda, Commandant of the flotilla, Artificer Engineer I. Tanaki, and two petty officers and two men were slightly wounded. The leading boat of the 17th flotilla, torpedo boat No. 34, received a shell in the fore boiler room at about 9.15 p.m., the same night; the steam-pipes, water-supply pipes, etc., were broken; a large hole was produced on the port side; a succession of shells hit the engine room; and

water coming in by and by through the bow, she sank at about 10 o'clock. Four petty officers and three men were killed, and Lieutenant-Commander Y. Aoyama, Commandant of the flotilla, and twelve others were wounded. Torpedo boat No. 35 of the 18th flotilla received a shell at 9.30 p.m., and Lieutenant M. Soyejima and two men were wounded, one of the crew of the aft torpedo tube being also wounded later. After this she received shell after shell in engine room, boiler room, and other parts, and the leaking could not be mastered. Sub-Lieutenant Y. Nakayama and seven men were wounded. The boat sank at 3.35 a.m. on the 28th, two of the crews who had been previously wounded were drowned. On torpedo boat No. 68 belonging to the first flotilla, a shell struck the fore and aft boiler rooms: three stoker petty officers and a stoker were scalded to death; two petty officers and two men were wounded severely, and a warrant officer and two men slightly. Torpedo boat No. 32 of the 17th flotilla was hit by some shells, Sub-Lieutenant J. Taira was killed, one man was severely wounded and six others slightly. On No. 36 torpedo boat of the 18th flotilla, a warrant officer and a man were severely wounded and an assistant engineer and a man slightly.

In this engagement, which continued for two days, of the warships which exchanged fire with the enemy's (the *Fuso*, *Tukao*, *Tsukushi*, *Maya*, *Chokai*, and *Uji* were not struck once by a Russian shells; which was also the case with the converted cruisers, torpedo-depôt ships and converted gunboats), all except the four ships *Itsukushima*, *Suma*, *Tatsuta*, and *Yayeyama*, were struck by shells or splinters: of nineteen destroyers and twenty-six torpedo boats which equally with the preceding were exposed to the hostile fire, thirteen of the former and ten of the latter received shells, splinters, or projectiles of machine-guns. The number and size of the shells which hit our ships can not of course be known exactly, but judging from the reports made by the chief surgeons of all the ships, and from those shells which remained in the ships without exploding, from the nature of the damages done to the ships, and from the size of the splinters which were left in the bodies of the killed and wounded, the shells of large calibre, 12 c.m. and above, seem to have been 115, the smaller shells being almost equal in number; and the splinters of shells exploded on the water and the projectiles of machine-guns must also have amounted to a hundred or more of each.

The number of the killed on the spot were eighty-eight. Among the wounded, there died on board ships twenty-two, in the hospitals, seven; those invalided from service on recovery of wounds came to fifty-one; those discharged from the hospitals recovered and fit for further service were 136; and those treated and recovered on board were 396. Thus the killed and wounded amounted to 700 persons in total. These figures include the men who died or were wounded in discharge of their duty quite independently of the hostile fire; namely, drowned by the collision and sinking of torpedo boats, injuries to the organs of hearing from the vibration caused by the firing of our guns, wounds in the fingers from opening and closing of breech-blocks, slight wounds to hands and feet from carrying shells and cartridge cases or handling engines. And if we deduct these from the preceding number; namely, two cases of immediate death, three persons invalided from service, twenty-four cases of recovery in the hospitals, 161 cases treated and recovered on board the ships: 190 in all, the remainder; namely, 115 dead, 48 invalided, 347 recovered, we have 510 as our total for cases of deaths and wounds caused by hostile fire. The ratio of the deaths to the wounded is 1 to 3.43; and if we compare the total cases of deaths and wounds, viz: 700, with the whole crews of the ships, vessels, and boats, it was 33.22 per 1,000, that is, one case of death per 186 persons. The ratio of the killed and wounded by the enemy's shells to the number of the crews on the ships, vessels, and boats is 30.32 per 1,000; that is one case of death per 146 persons, and one case invalided per 350 persons. Thus, the loss of life and the injuries sustained in this great battle were far smaller than could have been expected. There may have been many causes for this; but one must have been that, as a result of past experiences, the crews of small calibre guns, ambulance men and others who had no direct concern in the long range fire, were ordered not to expose themselves uselessly, except the duty called.

The following table shows the losses and casualties sustained in this great naval battle.

Divisions and Ships, Vessels, and Boats.	Killed on the Spot.	Wounded.					Total.
		Died after- wards on Board.	Died in Hospitals.	Invalided from Service.	Recovered in Hospitals.	Recovered on Board.	
1st Division.							
<i>Mikasa</i>	6	2	—	6	17	82	113
<i>Shikishima</i>	12	1	—	2	8	14	37
<i>Fuji</i>	7	1	—	4	8	10	30
<i>Asahi</i>	7	1	—	2	6	15	31
<i>Kasuga</i>	5	2	—	2	3	15	27
<i>Nisshin</i>	5	—	1	4	13	73	96
2nd Division.							
<i>Idzumo</i>	3	—	1	5	3	18	30
<i>Adzuma</i>	9	1	1	2	6	21	40
<i>Iwate</i>	—	—	1	—	2	12	15
<i>Tokiva</i>	—	1	—	—	1	13	15
<i>Yakumo</i>	2	1	—	1	1	7	12
<i>Asama</i>	1	2	—	7	3	3	16
<i>Chihaya</i>	—	—	—	—	—	4	4
3rd Division.							
<i>Kasagi</i>	—	1	—	2	1	6	10
<i>Chitose</i>	2	—	—	1	1	2	6
<i>Otona</i>	2	3	1	2	5	17	30
<i>Niitaka</i>	1	—	—	—	2	1	4
4th Division.							
<i>Nanina</i>	1	—	—	1	1	13	16
<i>Takauchi</i>	—	—	—	—	—	4	4
<i>Akashi</i>	1	2	1	—	1	5	10
<i>Tsushima</i>	4	—	—	2	8	7	21
5th Division.							
<i>Matsushima</i>	—	—	—	—	1	—	1
<i>Hashidate</i>	—	—	—	1	4	2	7

Divisions and Ships, Vessels, and Boats.	Killed on the Spot.	Wounded.					Total.
		Died after- wards on Board.	Died in Hospitals.	Invalided from Service.	Recovered in Hospitals.	Recovered on Board.	
6th Division							
<i>Suma</i>	—	—	—	—	—	3	3
<i>Chiyoda</i>	—	—	—	—	—	2	2
<i>Akitsushima</i>	—	—	—	—	1	1	2
<i>Idzumi</i>	1	2	—	2	1	4	10
1st Destroyer Division.							
<i>Fubuki</i>	—	—	—	—	—	1	1
<i>Arare</i>	—	—	—	—	—	1	1
2nd Destroyer Division.							
<i>Oboro</i>	1	—	—	—	—	6	7
<i>Isudzuchi</i>	—	—	1	—	4	8	13
<i>Akebono</i>	—	—	—	—	—	4	4
3rd Destroyer Division.							
<i>Usumino</i>	—	—	—	—	—	1	1
<i>Sazanami</i>	—	—	—	—	1	—	1
4th Destroyer Division.							
<i>Asashio</i>	—	—	—	1	—	—	1
5th Destroyer Division.							
<i>Shiranui</i>	2	2	—	1	1	9	15
First Flotilla.							
No. 69 Torpedo Boat	2	—	—	—	1	5	8
No. 68 Torpedo Boat	4	—	—	1	5	—	10
17th Flotilla.							
No. 34 Torpedo Boat	7	—	—	—	11	1	19
No. 32 Torpedo Boat	1	—	—	—	6	1	8
18th Flotilla.							
No. 36 Torpedo Boat	—	—	—	—	4	—	4
No. 35 Torpedo Boat	2	—	—	2	5	2	11

9th Flotilla.							
<i>Tsubame</i>	—	—	—	—	—	1	1
10th Flotilla.							
No. 43 Torpedo Boat	—	—	—	—	—	1	1
11th Flotilla.							
No. 72 Torpedo Boat	—	—	—	—	1	—	1
No. 74 Torpedo Boat	—	—	—	—	—	1	1
Grand Total...	88	22	7	51	136	396	700

General Sketch of our Treatment of the Wounded.

The Second Russian Pacific Squadron left Nossi Bé, Madagascar Islands, on the 16th of March, 1905; passed the Straits of Malacca on the 8th of April; anchored in the Kamranh Bay the 13th; then entered Hon Kohe; united with the Third Pacific Squadron the 9th of May; and having left Hon Kohe at 3. a.m. on the 15th, moved northward. Our Combined Fleet, assembling on one side of the Channel of Tsushima, had long been waiting for them. In the mean time, the chief surgeon on each of the ships were collecting materials and making every possible provision for the treatment of the wounded. Surgeon-General S. Sudzuki, attached to the First Squadron and on board the *Mikasa*, was at this time entrusted by the Commander-in-Chief of the Combined Fleet with all important arrangements relating to the medical and sanitary affairs of the fleet. This officer in anticipation of a great battle, and in order to lessen the number of casualties and to ensure that there should be nothing lacking or amiss in the relief of the wounded, had made a list of points to be taken care of, and had distributed it to the chief surgeons and assistant surgeons on each ship of the Combined Fleet, requesting them to enforce the same. In accordance with this action, the Commander-in-Chief of the Combined Fleet, Admiral Togo, gave the following instructions to the whole fleet; and, at the same time, a First, followed by a Second Notification, was issued over the name of the Surgeon-General attached to the Combined Fleet. These are here given at full length.

Extracts relating to medical and sanitary affairs taken
from the Instructions to the Combined Fleet.

1. Though our ships of the fleet are all ready for the coming battle, we yet deem it advisable that all objects above the water-line, which are likely to become media for the explosion of the enemy's shells, (those always excepted which necessity requires,) shall be put ashore or desposited below the water-line.

2. The fighting quarters of the men, shall (with due regard to the circumstances of each ship) be changed in such a way as may minimize the risk of men being needlessly wounded, by keeping non-combatants, ambulance men, the crews of light guns, and the like under cover in protected parts, until they are needed. The bitter experiences of the *Mikasa* in the battle of the Yellow Sea, have shown us, that these are points to be especially considered.

First Notification for the Treatment of the Wounded.

1. Those ships which have ice-machines provided, shall, before the opening of an action, prepare ice sufficient for treatment, in the dressing stations; for, in the case of contused wounds of important parts, an immediate application of ice may be necessary. After the action has commenced, it will be too late to make application to the engine department. You are, therefore, all requested not to fail in preparing beforehand a tub wrapped round with blanketing and provided with a grated bottom for holding the ice; and also to have hammers and chisels at hand for breaking and crushing ice required.

2. According to past experiences, the cross bars, straps, etc., of stretchers often get detached and lost, and are found only after the engagement is over. Therefore care should be taken to have such things fastened beforehand to the stretchers.

3. Stretchers distributed in several places are often blown to pieces and destroyed by shells; and much inconvenience has been experienced in carrying wounded men on them.

4. In transporting the wounded during the engagement, it more frequently happened that the wounded were conveyed by hand.

5. Dressing materials should be provided abundantly. They are in much greater demand, than one would expect them to be.

6. 6-inch wide roller bandages of cotton have been found convenient for several purposes. Have them ready in the dressing stations.

7. Operating gowns shall be provided in such quantities as to be double the number of the medical officers and sick berth staff.

8. Ambulance men should carry first-aid packages of a larger size than hitherto.

9. Splints should be kept on hand properly padded with cotton wool; if these are not applicable owing to the nature or condition of the wound, others are of course to be promptly made.

10. In the dressing stations as well as in the places where the wounded are received, pitchers shall be provided there, and water shall be given plentifully to any that complain of thirst.

The dressing stations and receiving places, being generally on the lower deck, are shut on all sides during an action. Consequently, owing to the insufficient ventilation, the heat in summer and even in spring becomes most oppressive and trying. For the comfort of the wounded, it is well to have a plentiful supply of fans and to let the patients use them freely.

11. In case the dressing stations are established in ward rooms, as on second class cruisers and below, the sides shall be covered with canvas screens or mantlets.

12. On destroyers, the dressing materials shall be divided into two parts, and one part shall be deposited in some suitable place, that can be used as a second dressing station in case the first should be destroyed.

13. The above cautions are the outcome of past experience; but on ships which have never yet made the acquaintance of hostile shells, such experience may be wanting. As the coming battle will be the decisive one of the present naval war, it is needless to say every man should discharge his duties with firmness and resolution.

14. A preliminary report on the wounded shall be presented as soon as possible after the battle; the date and place of the battle shall always be mentioned, and those who are to be sent to the hospital shall be clearly distinguished

from those who are to be treated on board. Should it be found that a mistaken report has been made, or one that requires some addition, a supplementary report shall be sent immediately.

15. As to the principles to be followed in treating the wounded, aseptic method shall be adopted so far as possible; and treatment on board shall be limited to urgent measures, except in unavoidable cases. These shall, with all possible speed, be sent to hospital ships to be shipped home.

Second Notification.

1. It is evident, from our past experience, that a battle will produce many cases of a rupture of the tympanic membranes, and it has been suspected that these injuries may sometimes have been due to careless and inadequate plugging of the ears. You are hereby requested to go to each division yourselves, and instruct the men how to plug their ears; and let each man plug his own ears in your presence and examine whether it be right or not. We are afraid that if, as hitherto, we content ourselves with merely distributing cotton wool among the men, the plugging will differ from one man to another, and so fail to attain its end, by being either too loose or too tight.

2. It must be remembered that, before the opening of the action, every one on board should, if possible, wash his body and put on clean clothing. This has much to do with the rapid recovery of wounds sustained.

3. Men of the engineer branch should have every part of their bodies covered. Clothing has a great protective power against scalds from steam, on the bursting of pipes. On destroyers and torpedo boats, special care should be taken on this point.

4. On the bridge, compass bridge, etc., where the officers in command of the ship or fleet are, a certain number of the larger first-aid packages should be kept provided, at easily accessible and conspicuous place. These may be of much use, in case any of the ambulance men stationed there should be killed.

5. On the ships where two dressing stations are established, a superintendent be appointed, who shall take care that the wounded are not crowded into either of them.

6. In the preliminary reports on the wounded, even where the corpses have

not been found, the names and ranks shall be mentioned; and all marks, etc., on the corpses, shall be noted down.

In accordance with these notifications and from the lessons of their own experience, the surgeons of the fleet had made every possible provisions for the treatment of the wounded, and were waiting for the coming decisive battle. Early on the morning of the 27th of May, the first intimation was received of the near approach of the Russian Squadrons.

The whole fleet immediately moved forward. On the way to Okinoshima, the dressing stations were arranged, and stretchers, first-aid packages, and cotton-wool for ear plugging, distributed about the ships in likely places. When the signal was given to clear for action, the medical officers and staff went to their posts in the dressing stations; a part of the ambulance men were told off to keep under shelter on the upper and main decks; and on smaller and unprotected cruisers, the surgeons did the same, waiting till duty should call. As casualties occurred, the bearers took the wounded in hand, sometimes dressing their wounds on the spot, and sometimes carrying them, with their wounds untouched, straight to the dressing stations. In most cases the wounded were conveyed by hands, only in a few cases was the Totsuka stretcher used. Excepting on the destroyers and on a few warships, the wounded were generally treated after the aseptic method. Our past experience and the training we had given our men, as well as the comparatively small number of wounded in this battle, enabled the sick berth staff and ambulance men to carry out their operations in a very satisfactory manner. On smaller ships and vessels, the waves often washed the upper deck, the ships were tossing heavily, and the dressing materials kept rolling about. The surgeons had a good deal to contend with: but here again the number of the wounded was small, and the work was pushed through. On the destroyers, owing to the bad weather, no dressing stations could be arranged. The surgeons on board these vessels were obliged to content themselves with giving the wounded only urgent and necessary treatment, and had nowhere to stand during the action, except on the upper deck. It was not, until the action was over, that the wounded could be brought to the dressing stations for proper treatment. On torpedo boats carrying no medical officer, the wounded had their wounds dressed by their com-

panions with the contents of the No. 4 medicine chests. It was the Naval Hospitals of Sasebo and Maidzuru as well as the Takeshiki Sick Quarters, which principally received and treated those who were wounded in this naval battle.

Surgeon Inspector U. Ishiguro, Chief Medical Officer of the Takeshiki Sick Quarters, was convinced of the near approach of the battle and was busy making his preparations. The casualties on destroyers and torpedo boats during the night attack on the 27th of May were as follows:—From sunken torpedo boats, two warrant officers, eight petty officers and men, and a civilian employé on torpedo boat No. 34, an officer and five men on No. 35, and a warrant officer on No. 69. These were picked up by their consorts and were admitted to the sick quarters from an early hour on the morning of the 28th. Subsequently, wounded were received from the following boats; namely, an officer and two men from the destroyer *Ikadzuchi*, an officer, a warrant officer and two men from torpedo boat No. 36, a warrant officer, and four petty officers and men from torpedo boat No. 68, and four men from torpedo boat No. 32. The next day, the 29th, they received an officer, and four petty officers and men from the *Hashidate*, two men from the *Idzumi*, and a man from the *Nitaka*; and on the 30th, five petty officers and men with a civilian employé from the *Otowa*, three men from the *Chitose*, and three petty officers and men from the *Kasagi*. On the same day, the *Kobe Maru* called at the port on her way home from Chin-hai Bay, and took on eleven wounded men from the sick quarters that day, and the next day, twelve more. On the 3rd June, they received a man from torpedo boat No. 68, and two men from No. 32; and on the 8th, a man from the *Matsushima*; on the 10th, a man from the *Akitsuishima*; and on the 17th, a man from the *Idzumi*. Thus, they received and treated sixty persons in all; and the number of in-patients, on the 30th May, was fifty-four. Among those who were treated in the sick quarters were, besides the above, Lieutenant-Commander Y. Aoyama and fifteen other out-patients.

The first case received in the Naval Hospital at Sasebo, was on the 29th May, a wounded man, belonging to the *Shiranui*, from the *Sado Maru*. On the 30th, when the main force came to anchor in the port, they took in three officers, a warrant officer, six petty officers and thirteen men from the *Mikasa*; two officers,

a petty officer and seven men from the *Shikishima*; two officers, seven petty officers and three men from the *Fuji*; an officer and eight men from the *Adzuma*; a man from the *Tokiwa*; eight men from the *Idzumo*; an officer, two petty officers and nine men from the *Nisshin*; two men from the *Akashi*; a man from the *Sazanami*. The following day, the 31st, they received an officer, a warrant officer and two men from the *Kasuga*. On the 1st June, the wounded amounted to eighty in all.

In the Naval Hospital at Maizuru, when the *Asahi* and *Asama* arrived conveying a prize (the *Orel*) on the 30th May, they received two petty officers and six men from the *Asahi*, and three petty officers and seven men from the *Asama*. In the Naval Hospital at Kure, on the 5th and 6th June, they received Vice-Admiral Misi, a warrant officer, three petty officers and a man from the *Nisshin*; also, the men from the Takeshiki Sick Quarters brought by the *Kobe Maru*, and the twenty-nine wounded persons from the warships at Sasebo; and subsequently an officer from the *Saikio Maru*. In the Naval Hospital at Yokosuka, on the 13th June, they received through the *Saikio Maru* ten petty officers and men of the *Tsushima*, a man of the *Otowa*, and six transferred from the hospitals at Sasebo and Kure.

On the day of the battle, the Hospital Ships *Kobe Maru* and *Saikio Maru* were at anchor in Chin-hai Bay. The former received two wounded men from the *Naniwa*, on the 29th May; but was ordered back to Takeshiki, where she received some in-patients from the sick quarters at the port; namely, two warrant officers attached to the first flotilla; a midshipman, a petty officer and two men of the *Hashidate*; two men of the *Nitaka* and *Idzumi*, one each; two men of the 17th flotilla and a man of the 18th. The next day (the 31st), they received a petty officer of the *Hashidate*, a man of the *Idzumi*, a petty officer and two men of the *Kasagi*, a petty officer, three men and a civilian employé of the *Otowa*, and two men of the *Chitose*: thus, having received twenty-three patients, the ship left for Sasebo. Having entered the same port at 11 a.m. on the 1st June, they received a petty officer and two men from the *Iwate*, two men from the *Yakumo*; at 6 p.m., she set sail for Kure, and on the way, a writer of the *Iwate* died. When she entered the Port of Kure on June 2, the earthquake had just taken place; but as soon as the preparation for the admission of patients had

been completed, they sent four patients on the 3rd, and twenty-five on the 4th to the hospital; and the ship, setting sail the same day, returned to Sasebo at 7 p.m. on the 5th. On the *Saikio Maru*, they received, on the 30th May, a petty officer and nine men from the *Tsushima* in Chin-hai Bay, and a man from the *Otowa* on the 4th June. At 4 p.m. on the 7th, she left Chin-hai Bay for Sasebo. Having entered the port, they received from the hospital three senior officers, two officers, a chief warrant officer and a man; at 7 a.m. on the 8th, the ship set sail, and having called at Kure on the 10th, sent an officer to the hospital. Then she received Vice-Admiral Misu from the hospital, and departed for Yokosuka. Having entered the port on the 13th, her numerous invalids were transported to the hospital; but the vice-admiral left the vessel at once for Tokyo. Thus the greater number of the in-patients wounded in the battle of the Sea of Japan were received within four days in the sick quarters and hospitals, without any help from the hospital ships; these vessels served only for the transportation of the wounded between the sick quarters and the hospitals.

SECTION IX. NAVAL CO-OPERATION WITH THE ARMIES.

Naval Assistance in Battle of Yalu:—On April 25th, 1904, a naval detachment consisting of the gunboats *Uji* and *Maya*, torpedo boats Nos. 68 and 69, and 4 armed steamboats of the *Saiyen*, *Heiyen*, *Uji* and *Kuimon* went up the river for the purpose of assisting the First Army in crossing the river. The action continued till the first May. The Russians fired at us frequently, but no shells or bullets struck us. However, two persons on the *Maya* had their ears injured, and two others on the armed steamboat of the *Saiyen* were slightly wounded, both in the discharge of their duties.

Naval Co-operation in the Capture of Nan-shan:—On May 26, 1904, a gunboat squadron consisting of the *Tsukushi*, *Heiyen*, *Akashi* and *Chokai* with the first torpedo boat flotilla was detailed to assist the Army in assault on Nan-shan. The *Akagi*, *Chokai* and torpedo boats, taking advantage of their light draughts, approached close to the shore and were shelling the Russian position. At 7 a.m. a Russian shell exploded beside one of the fore 12-c.m. guns of the *Chokai*, killing two men and wounding an officer and three men. At 5.14 p.m., at the

close of the day's work, a shell exploded on the surface of the water near the ship's stern, with the result that Commander M. Hayashi, the captain of the ship, was killed, and an officer, a warrant officer, two men and a civilian employé were wounded. Except the *Chokai*, none of our ships or boats suffered damages from hostile fire, only two men on the *Tsukushi* and one on the *Chokai* being wounded in their ears.

Co-operation in the Attack on 203 Metre Hill :—On the 30th November, 1904, the *Akagi* at anchor north-west of St. Abb's Head, was shelling the Russian position near Pigeon Bay, which responded briskly to our bombardment. At 1.40 p.m. a shell exploded on the sea to port of the ship, the splinters, wounding two men near the bridge. An officer and six men had their ears injured by the firing of our guns.

SECTION X. THE NAVAL BRIGADE.

The Naval Heavy Gun Brigade :—On the 5th May, 1904, a Naval brigade had been thrown ashore at Yen-ta-ao in advance of the Second Army under the command of General Oku, to occupy the place and protect the disembarkation. While this was engaging with the Russians at Tehlisze, the brigade had to garrison Ta-liu-kia-tun. Till then it sustained no casualties among the men. Afterwards a Naval Heavy Gun Brigade was organized and joined the 3rd Army in the investment of Port Arthur, under the command of General Nogi. The first casualties in the brigade were sixteen killed and wounded on the 26th July. Preceding the first general assault on Port Arthur on the 18th August, the brigade began the preliminary bombardment from the 7th, and from that time until the capitulation of Port Arthur, every sort of assistance was rendered to the land operations, whether by bombarding the Russian ships in the harbour, or by shelling the fortresses, the work involving frequent changes of position. The total loss amounted to 343 in killed and wounded, which compared to the daily average strength of the brigade is about 32 per 100.

During the whole period of the siege of Port Arthur, the total number of killed amounted to 57, which is about 4.5 per cent of the average strength ; of

the latter 31 died on the spot, 16 had at least received first-aid before they died. Moreover, there were cases of death, seven in the Army Field and Stationary Hospitals, one each on the Hospital Ships *Saikio Maru* and *Kobe Maru*, one in the Military Reserve Hospital at Hiroshima.

The wounded in the Naval Brigade received treatment from the ambulance party; were delivered to the Army Field Hospitals and Stationary Hospitals through the dressing stations; and were then sent home, and put in the Naval Hospitals through the Military Reserve Hospitals. At a later stage of the operations, the wounded men of the Navy came to be treated by our medical staff and were then removed to our hospital ships through Dalny. Some were also temporarily taken into the sick-rooms of the Defence Corps at Dalny. The wounded treated in the Naval Hospitals at home were 118 in all; of whom thirty-two were invalided on recovery, while the rest continued in the service. 168 of the slightly wounded did not need to be sent back and were treated in their respective divisions. Among the above cases of wounds, however, are included cases not due to the enemy's shells. These amount to forty-seven.

The Force Temporarily Landed in the Liao-tung Peninsula:—When the land operations against Port Arthur were gradually developing, our Navy established observation stations on Namakoyama and 203 Metre Hill, and sent forces according to necessity. These forces were fired on from time to time by the enemy; a man was killed, on July 28, by a musket ball at Siao-ping-tao; on the 12th November, two petty officers from the *Fuso* were killed at Cheng-kia-kow. On the 30th November, a petty officer of the same ship was wounded in the head by a shrapnel shell on Namakoyama and was afterwards invalided from service.

SECTION XI. THE NORTHERN SQUADRON.

The squadron convoying the expeditionary force for the occupation of Sakhalin left Ominato on July 4, 1905, arrived at the appointed rendezvous off Enzuma Promontory on the 7th, disembarked the troops there and anchored at Korsakovsk. On the 24th of the same month, again convoying the military force, it

reached near Alkova in the northern portion of Sakhalin, and assisted the landing of the army; then it moved to Alexandrovsk, where it anchored.

In the preceding two actions, the landing parties were organized and thrown ashore in advance of the troops, but no resistance being encountered, no mishap took place among our men. During the whole period, the squadron operated in the northern quarters, only a few cases of killed and wounded occurred during reconnaissances along the coast of the Russian Maritime Provinces. Thus, on the 30th July, while chasing the enemy's force on land at Castries Bay, a seaman of the destroyer *Arare* was wounded; on the 13th August, when they put ashore a landing party from the *Fubuki* at Lazareva, and were nearly at the wharf, they suddenly received a heavy fire from the woods ahead, and two men of the *Fubuki* were severely wounded, a petty officer was killed, and a man wounded on the armed-boat of the *Nisshin*. The severely wounded cases were removed on board the *Arare*, after having been treated on the *Fubuki*, and sent to the *Saikio Maru* at Alexandrovsk; and the one killed was transported to the *Nisshin* through the *Arare*.

CHAPTER II.

HANDLING OF THE KILLED AND WOUNDED IN NAVAL ENGAGEMENTS.

SECTION I. CARRYING THE WOUNDED.

I. Carrying by hand.

This method of conveyance is, as the name indicates, one by which the bearer carries the wounded in his hands without the help of any instrument. The points on which training has been given hitherto on board our ships are as follows :—

Method i. When a single bearer conveys a single wounded person :—

(a). The arm of the wounded person, on his unwounded side, is made to pass around the neck of the bearer and over his shoulder. The bearer holds the wrist of that limb with one hand, and passing his other arm round the loins of the wounded man, assists him to walk along. (b). The bearer puts one hand between the thighs or on the buttock of the wounded man, encircles his body with the other, so carries him away in an approximately lateral position. (c). The bearer carries the wounded man on his back. (d). The bearer conveys the wounded person by placing him astride his shoulders.

Method ii. When a couple of bearers carry a single wounded person :—

(a). Each bearer grasps his own left wrist joint with his right hand. Then the free left hand of each bearer grasps the right hand wrist of the other bearer, thus making a square four-handed seat. The wounded person is placed in a sitting posture on this seat, passes one arm round the neck of each bearer, and is thus carried off. (b). Bearer A grasps the lower part of his left forearm with his right hand, at the same time grasping the lower end of the left forearm of bearer B, who in return grasps the lower part of the right forearm of bearer A with his left hand, so that a triangular three-handed seat is formed. Bearer B then seizes the left shoulder of bearer A with his free right hand, the wounded man being placed on the seat in such a way as to lean against the stretched arm of

bearer B. He is then carried off. (c). Bearer A grasps the left hand wrist-joint of bearer B with his right hand, and bearer B in turn grasps the right hand wrist-joint of bearer A with his left hand so that a two-handed seat is made. Each bearer then places his free hand on his partner's shoulder on the side of the disengaged arm. The wounded man is then placed on the seat thus produced in such a way as to lean against the stretched arms, and is conveyed away. (d). Bearer A placing himself between the thighs of the wounded man supports both his legs. Bearer B passes both arms from behind under the armpits of the wounded man and clasps his hands over the breast. In this way, the person is lifted and conveyed away.

Method iii. When a wounded man is carried by three, four, or more bearers ;— There is no systematic manner to be followed in this method. Broadly speaking, however, the wounded man is lifted up by several bearers with their hands applied to his occipital, dorsal, gluteal, popliteal regions etc., and is thus borne away. This method is most needed for the conveyance of severe cases suffering from heavy or numerous wounds.

Of the many methods of conveyance by hands described above, those chiefly employed during the late war were (a) and (c) forms in method i, (d) form in method ii, and method iii. In conveying seriously wounded persons, method iii was most frequently used (see the illustrations).

II Conveyance by Hand with the Help of a Four Tailed Bearing-band.

This method was first devised by Staff Surgeon S. Kimura during the Japan-China war when he was the chief surgeon on board the flag-ship of the Western Squadron. In this method a bearing-band is used as supplementary to the conveyance by hand. The band consists of a folded piece of strong cotton cloth about two metres long, which is rent in twain lengthwise for a certain distance from each end, thus making a band with four tails with a body in the middle. The tails at each end are tied together so to form loops. The wounded person is placed on the body, that is, on the broad part of the band in a sitting posture. Two bearers then put each his head and one arm into the loop on either side, so that the loops rests on their shoulders. They then lift up their burden

and carry him to his destination, using their arms to give him more support. In case of need the assistance of a third bearer can be called for supporting the legs of the wounded man in his hands. Bearers A and B have each one hand free, and are thus at liberty to steady themselves by holding on to means of support, as for instance hand-rails or balustrades in going up or down ladders or stairs.

It was our intention to adopt the above as one of the methods for conveying wounded in time of actual service, and with this view, drill in it had been given on board many ships before the Russo-Japanese war; but practically we found that there were very few cases in which the method was employed.

On board the *Takachiho*, two plans had been devised somewhat similar to the above, and some of the crew had been trained in them. They are described here.

No. 1. This is a method of conveyance by a single person. A doubled cotton cloth, a 0.33 Metres wide and two metres long, is folded three times lengthwise, and is placed under the buttock of the wounded person to be carried. The ends of the band are then tied together over the shoulder of the bearer on the side opposite to that on which the wounded person is carried. The wounded man sits in the sling thus formed, and is thus carried by the bearer whose arms are around him.

No. 2. For the second method, two bearers are required. Bearer A places himself behind the wounded person, passes a band several times around the back and chest of the person, and then with the ends of the band which are passed under the axilla of the wounded person, makes a loop which he fastens behind his own neck. Then bearer B standing in front or on either side of the wounded person, picks up his legs. In this way the two bearers carry him away.

III. Method of Conveyance by Means of Instruments.

During the Japan-China war, the stretchers provided in our ships were of various forms, and there was no fixed type, except for those which were designed for use on land. Some resembled Mr. Macdonald's stretchers, some were like Mr. Gihon's stretcher, some were of the type devised by Surgeon Inspector

T. Yoshida, and others were carrying instruments planned by Captains Miura and Arai. After the conclusion of the Japan-China war, the Imperial Navy underwent a sudden expansion, and numerous battle-ships, armoured cruisers, etc., were at that time constructed in foreign countries, and with the new ships several new types of stretchers were introduced into our Navy. It being then deemed advisable to have all our ships supplied with stretchers of uniform pattern, Baron Saneyoshi, Chief of the Bureau of Medical Affairs of the Imperial Navy, submitted the matter to discussion at his conference (held in February, 1902) of Chief Surgeons of Naval Stations, the Standing Squadron, and the Secondary Naval Stations. After very careful consideration this conference concluded that it was advisable to have but two forms of stretchers viz., canvas chair and field stretcher, for ship-board and for field use, and that on and after the 26th of June of that year new stretchers should be constructed in conformity with the types adopted. In November of the following year, 1903, the adopted types were publicly announced. The eve of the Russo-Japanese war further saw the invention of Totsuka stretcher.

We shall now describe the above mentioned three kinds of instruments for conveying the wounded, as they were employed during the Russo-Japanese war.

1. The Field Stretcher.—This stretcher consists of an oblong piece of canvas 1.85 metres in length and 0.61 metres in width, which has to serve as a canvas bed. There is a lengthwise loop, running along each side of the canvas through which a bamboo-pole 2.75 metres long is passed, in such a way that the ends of the two poles, protruding at both extremities of the canvas, serve for handles. Along each end of the canvas bed there is a cross bar made of steel 0.51 metres in length, one end of which is connected by a joint to a steel ring screwed on to the longitudinal pole on that side, the free end of cross bar being, by means of a pin attached to the bar by a chain, fixed to a ring which may be fastened to the longitudinal pole on that side. At each end of the canvas bed, there are three holes, which serve in fastening the canvas to the bar. For securing the patient to the litter, there are no straps permanently attached to the canvas, but the latter has a certain number of holes wherever necessary in places corresponding to shoulders, thighs and legs of the patient, and one has simply to make

use of a long strap of cotton cloth passed through these holes to secure the patient in case of need. The perforated parts of the canvas are doubled so as to enable them to bear the strain imposed at those places. Accessory articles for this stretcher are a couple of bearing bands or slings, a screen made of water-proof canvas which will serve as a protection against both heat and rain, and a pair of steel props for holding the screen, and two hemp cords. The bands or slings mentioned above are of canvas webbing. When necessary, the bearers will carry the stretcher by the help of these slings thrown over their shoulders—the ends being fastened to the bamboo-handles mentioned before. For fixing the props of the screen as a protection against heat and rain over the stretcher, both ends of each prop are inserted into the holes at the extremities of cross bars, in such a way that the props (which are elastic) bend over in an arch. The two hemp-cords are used in tying the cross bars to the canvas: also in binding up the canvas when it is rolled up around the longitudinal poles when the stretcher is to be put aside.

This stretcher, as its name indicates, is provided on board each vessel for the use of the landing parties, but it is likewise employed in sending away patients from a ship to a naval hospital. It has also been used in the conveyance of wounded on ships during actual battle, although the length of the handles forming the extremities of the bamboo-poles has often proved very inconvenient for handling on board a ship. On land, the breaking of a bamboo-pole has more than once rendered the stretchers useless, and experience has showed us that it has still another defect: it lacks props to support the stretcher when it has to be placed on the ground. An illustration of this type of stretcher is given in the accompanying diagram (accessories omitted).

2. Canvas Chair:—This is employed in conveying wounded men from the tops or the engine rooms. It consists of a canvas seat with high back and sides, and open in front. The seat is about 0.44 metres in lateral as well as longitudinal diameter, and the vertical diameter of the back is over 0.76 metres. Both sides are incised off in the forms of an inverted arch, so that the vertical length of each side at the middle line measures over 0.39 metres. The upper fringes of the back and sides are bound with hemp-cord, and the front

corners of the lateral sides and the outer corners of the upper border of the back side are tugged into the iron-ring (b) by means of hemp-cords. These hemp-cords being tied together above the ring are made so as to embrace the brass-eyelet (a) lying above. This enables the thing to be hooked in a tackle and whip. To the inner back side of the canvas bag are attached a breast-band (c) and an abdomen-band (d) for supporting the body of the person placed on the chair. The seat of the chair is formed of a flat wooden board (e) with a hole of about 7 inches in diameter in the middle, the board being wholly covered with canvas. The iron-ring (b) has a diameter of 0.333 metres and is enveloped in canvas. Long adjusting cords attached to the brass-eyelet (a) and to the bottom of the seat prevent the chair from tilting whilst in the air with the patient in it.

3. Totsuka Stretcher:—The stretcher of this type was first devised by Surgeon-General K. Totsuka, Director of the Sasebo Naval Hospital, and was supplied, in the year 1903, to the ships belonging to the Combined Fleet then assembled in the port. Under the name of Totsuka stretcher, it was extensively employed on board our ships during the late war, and proved very efficient in the conveyance of the killed and wounded.

We here give the main points of the construction and handling of this instrument taken from the inventor's report to the authorities. The stretcher consists of a bamboo-blind about 1.502 metres square. Its inner side is lined all over with canvas long enough to overlap the upper and lower extremities of the blind by 0.901 metres at the upper extremity and by 0.150 metres at the lower. To the upper and lower extremities are attached several hemp-cords as in a hammock, while to the back of the blind there are permanently fastened a couple of body-bands, upper and lower. In using it, the wounded person is placed on his back on the opened stretcher, is enfolded in the blind which is rolled up from both sides, and is then tied with the two bands mentioned above. Then the lower end of the blind is closed by tightening the cords attached thereto, so that the patient cannot slip down when the instrument is held in a vertical position.

By means of this stretcher, the wounded can be conveyed in a level, an inclined, or a vertical position, as the case may require. When level, it can be

carried by two bearers by means of the hemp-cords attached to the upper and lower ends, or it can be dragged along the deck like a sledge by a single person with the help of the hemp-cords at the upper end. Also it can be slid up or down in an inclined position on a ladder between decks by a single person holding it by the hemp-cord at the upper end. In taking a wounded up or down from a top or an engine room, it can be lifted up or let down by means of the hemp-cord attached to the upper end, and hooked to the tackle during the process. Furthermore, this stretcher can also be passed through a ventilation hole or a manhole as well as through the narrow hatch of a destroyer.

The defects of this stretcher, unanimously recognized by the chief surgeon of all the ships in our Navy were as follows:—

1. When the stretcher is held in a vertical position, the patient's body is pressed down by its own weight, and he is consequently compelled, much to his discomfort to support himself by his chin placed upon the edge of the stretcher.

2. In case the stretcher is lifted in a level position by means of the hemp-cords attached to the upper and lower ends, the canvas at the head of the stretcher naturally turns up at right angles to the head of the bamboo-blind. This presses forward the head of the person in the stretcher and causes pain.

3. When the wounded person in the stretcher has been wrapped up and bound with the body bands, he will naturally feel more or less pain from the pressure on the upper limbs and the sides of his body.

In order to remove these defects, several improvements were introduced into the stretcher during the war, both at the medical depôts attached to the naval hospital and on board the vessels. A change in the size of the stretcher, and the attaching of a pad stuffed with saw-dust to the part of the canvas which comes into contact with the patient's head were among the innovations thus introduced.

Fleet Surgeon B. Yamashita, Chief Surgeon on the *Chinyen*, made the following improvements which he put into actual use during the engagement of the Yellow Sea on August 16th, 1904.

1. The top of the stretcher was scooped off a little at the place where

TRANSPORTATION OF WOUNDED BY TOTSUKA STRETCHER. ILLUSTRATION No. 1.



Lowering a wounded from the bridge, slipping the stretcher down the ladder.

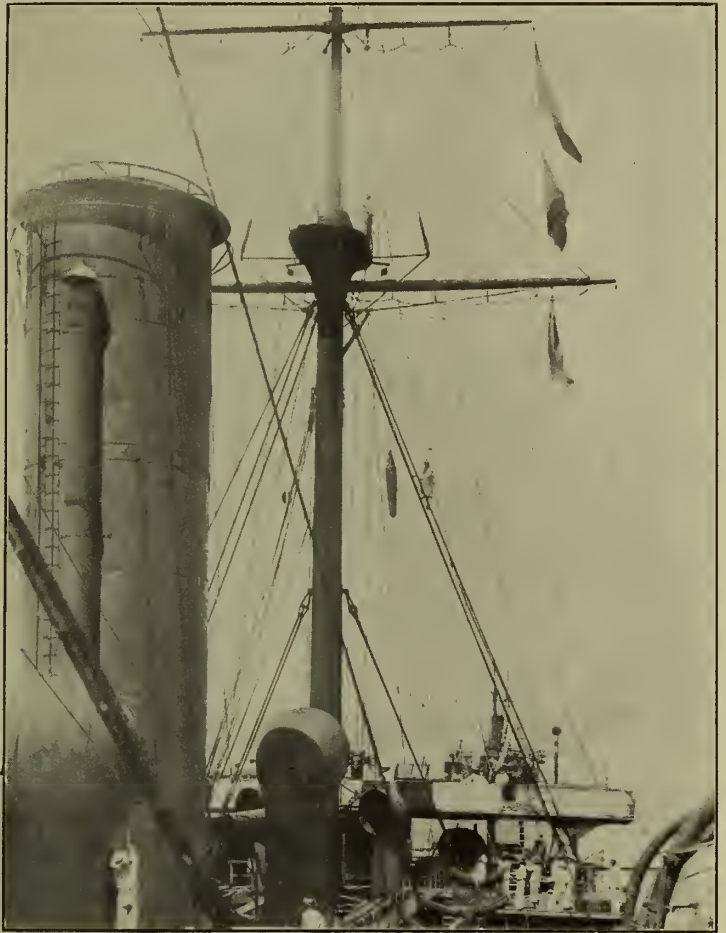


Passing a wounded man through a hatch on the upper deck of a destroyer to the dressing station below.



TRANSPORTATION OF WOUNDED BY TOTSUKA STRETCHER. ILLUSTRATION No. 2.

Lowering the wounded from the top—A shows the wounded man wrapped in the stretcher, coming down almost vertically.



Transferring patients from the quarter deck of the warship *Asama* into the boat alongside—A shows the wounded man and stretcher in oblique position.





the patients's chin would naturally come. Thus the pressure on the chin was removed. At the same time a chest band was fixed inside the bag, which helped to prevent the patient from slipping down.

2. By elongating some of the splints forming the middle part of the bamboo-blind so as to reach beyond the pillowed part, the pressure against the head was removed, even when the stretcher was lifted in a horizontal position by means of the cords.

3. The pressure against the upper limbs and the sides of the body was taken away by removing the bamboo-splints wherever they pressed uncomfortably against the patient's side.

4. The pillow was provided with a cord for adjusting its position, so that it could be put in a transverse position when the stretcher was being used, and in a longitudinal one when being stowed away.

The Totsuka stretcher has the advantage of being comparatively simple in structure, and consequently less costly. The handling of it can be easily understood by anybody, and the bamboo-splints which form the greater part of the stretcher will serve the purpose of splints for the whole body. For these reasons the stretcher has been unanimously recognized to be a very suitable instrument for the conveyance of wounded on board a ship or a boat.

It must, however, be admitted that the carrying of this stretcher in a horizontal position sometimes causes trouble. This was especially the case before its early defects had been removed, and for this reason comparatively little use was made of it during the late war.

The construction of the Totsuka stretcher used in our Navy, and a few of the practical methods of conveyance are shown in the annexed illustrations.

IV. Methods of Conveyance actually employed.

During the first stages of the war, conveyance by hands was mainly used, methods of conveyance by means of appliances coming into more frequent use as the war proceeded. Thus in the first attack on Port Arthur, nearly all the severely wounded cases were conveyed by hands alone, and also in the naval engagement of the Yellow Sea fought on August 10th, of the same year,

conveyance by hands was chiefly resorted to, stretchers and other being used only in a very few cases. In the engagement of the Japan Sea fought on May 27th and 28th, 1905, appliances were more frequently used than in previous battles, though conveyance by hand was still employed.

On warships, the dressing stations are generally placed at no great distance from any part of the vessels, but the ways of access leading to them are often very complex, and no matter how simple the instrument of conveyance may be, more or less time is required to make it ready for use and to place the wounded in it. There is also a certain amount of inconvenience in carrying it. It is natural therefore for the bearers to try to avoid these inconveniences by carrying the wounded directly in their hands, so that they may be taken to the dressing stations as fast as possible. There were also, at first, certain defects in the Totsuka stretchers which had been provided for use. For these reasons, in the first stages of the war conveyance by hands was chiefly employed. In the later stages, improvements were made in the Totsuka stretchers, the bearers gradually became more skilful in their management, and experience taught them how to deal with the wounded more calmly and effectively. This resulted in an increased use of the stretcher. Yet even so, whenever a large number of killed and wounded had to be taken away at one time, the conveyance by hands was naturally employed as being the more speedy course. In other cases the stretchers were more freely employed.

The instrument mainly employed during actual combat was the Totsuka stretcher, the field-stretcher being scarcely ever used. During the whole period of the war there were not more than two or three cases of men killed or wounded in the tops during an engagement and the reports afterwards received mention but two instances of the use of the stretcher in such cases. For conveying wounded on board the ships, or away from them, after an actual contest, both the Totsuka and field-stretcher were equally used.

We give below some short summaries of the reports sent in by the chief surgeons on board those ships which had a large number of killed and wounded during the engagements. It is hoped that from these a general view of the actual conditions with respect to the conveyance of the wounded may be obtained.

First Attack on Port Arthur.

The *Fuji*:—"We had Totsuka stretchers ready for use in the engine room and on the fore bridge: on the tops fore and aft, we had also provided the other appliances. In spite of our preparations, conveyance by hands was almost the only method resorted to, and it was but once, when carrying away a person wounded on the fore bridge, that a four-tailed carrying-band was called into requisition."

(Report by Fleet Surgeon R. Kido, Chief Surgeon to the ship.)

The *Hatsuse*:—"On each deck, we had provided Totsuka stretchers and a set of appliances designed by Chief Boatswain N. Uyeno on board the ship. With the exception of a single case in which the latter instrument was employed, conveyance by hands was in constant use. This was not because the appliances proved really useless, but because the wounded had to be taken away without any loss of time, and no moment could be spared for getting the implements ready for use."

(Report by Fleet Surgeon B. Seki, Chief Surgeon to the ship.)

The *Shikishima*:—"According to the regulations which require that non-combatants should be employed in the conveyance of the wounded, all such persons had been drilled in the methods of conveyance with instruments as well as by hand; but, actually, the latter method was alone employed, each wounded person being borne off by one or two bearers. The total number of the wounded thus conveyed was four."

(Report by Fleet Surgeon T. Ikeda, Chief Surgeon to the ship.)

The Naval Engagement of the Yellow Sea, fought on August 10th.

The *Mikasa*.—"The total number of casualties on board this ship during the engagement was 125 in killed and wounded, of whom 75 received treatment in the dressing stations while the battle was going on. Of these 75, 42 came into the dressing stations on foot without assistance, 29 were conveyed thither by hand, and 4 on Totsuka stretchers. The field-stretcher was not used in a single case."

(Report by Fleet Surgeon F. Kusano, Chief Surgeon to the ship.)

The *Kasuga*:—"The bearers brought in two men seriously wounded in the

legs, carrying them by the arm and legs in a very irregular manner, and assisted by comrades they found about them. This seems to have been done chiefly because the men wished to take the wounded as quickly as possible to the dressing station which happened to be very near the scene of the injury, but it must partly be attributed to the fact that the bearers lost their heads on seeing the disastrous nature of the wounds, and were thus in no position to put into practice the method of dressing and conveyance in which they had been previously drilled."

(Report by Staff Surgeon Y. Tachibana, Chief Surgeon to the ship.)

The *Nisshin* :—" Men wounded at the middle of the upper deck were conveyed to the dressing station by hand, the Totsuka stretcher being employed for men brought from the bridges. In the latter case, the ladders leading down from the bridges (which have an inclination of from 65° to 75°) caused considerable trouble to the bearers."

(Report by Staff Surgeon Y. Suzuki, Chief Surgeon to the ship.)

The *Yakumo* :—" When twenty-two cases of killed and wounded occurred at one time on the main deck, all the severe cases (except one which was taken away on a field-stretcher) were conveyed to the dressing stations by hand. In some cases, the bearer carried his charge on his back, and in others, a wounded man was borne away by two bearers, one holding the body of the patient from behind, while the other supported the legs with his hands. This was because the scene of the disaster was very near the aft dressing station, and there was no need to resort to other means of conveyance. Even the best trained and most loyal spirits grow impatient at seeing the sufferings of the wounded, and are disinclined to waste any precious moments in preparing appliances for removing them from the proximity of danger. For this reason, the conveyance of the wounded on board the ship by hand alone naturally comes into prominence."

(Report by Staff Surgeon S. Yano, Chief Surgeon to the ship.)

The Naval Battle of Ulsan.

The *Idzumo* :—" Bearers had been previously drilled in the use of the Totsuka stretcher as well as by hand. During action, however, conveyance by hand naturally became the main means, and we had no occasion to employ above-

mentioned stretcher, except in the carrying of the killed. This was because, being accustomed to the use of bare hands and feet, our bearers found the hand to be the most convenient and speedy method of carriage."

(Report by Staff Surgeon K. Mochizuki, Chief Surgeon to the ship.)

The *Iwate* :—" When the number of killed and wounded during the battle of Ulsan became very considerable, the captain issued an order to all the gunners on the disengaged side and to a part of the fire brigade to engage in the conveyance and relief of the wounded. Seriously wounded cases were in most cases carried by three bearers each, those less seriously wounded leaving one or two bearers apiece. The time required in taking a single person to the dressing stations was about a minute, more or less. In their impatience to carry the wounded to the dressing stations as speedily as possible, the bearers relied entirely on their hands. This does not imply that they were confused or excited, for it will be seen that in conveying the wounded, they took care to cause those who were wounded on the front side of their body to lie on their back, and to carry on their backs those who had been wounded behind. In one case of a fracture of the femur, the bearers had taken the precaution carefully to tie the injured leg to the healthy one."

(Report by Assistant Surgeon G. Etsura on board the ship.)

The *Naniwa* :—" One bearer took on his back a man who had received a blind wound in the left thigh and was coming, down from the bridge, and thus brought him to the dressing station by the way of the upper deck: another went up to the fore bridge and took a comrade who had sustained a perforating wound in the chest down to the lower deck. Two other bearers brought a dead man in on a Totsuka stretcher, and three others brought in a wounded man on the same instrument."

(Report by Surgeon H. Yamamoto, Chief Surgeon to the ship.)

The Battle of the Japan Sea.

The *Mikasa* :—" We used both hands and Totsuka stretcher for the conveyance of the killed and wounded. Seventy cases heavily wounded walked to the dressing stations on foot, leaning on the shoulders of the bearers; a sub-lieutenant

wounded in both eyes was carried by hand by two bearers; 6 cases killed and 7 cases seriously wounded were conveyed to the dressing stations on Totsuka stretchers with a couple of bearers each."

(Report by Fleet Surgeon T. Saigo, Chief Surgeon to the ship.)

The *Fuji*:—"A sudden message came that a fire had burst out in the aft turret and that there were heavy casualties. Bearers were at once despatched to the scene with three Totsuka stretchers. On the upper deck they met nine heavily wounded men who, having escaped from the disastrous scene were on their way to the dressing stations of their own accord. The bearers helped these men walk to the dressing stations, for the latter would not be carried by others. The killed and one man too seriously injured to walk, were brought up out of the turret in stretchers, the latter in a canvas chair. A messenger found on the shelter deck suffering from concussion of the brain, was carried by a bearer on his back, and the other wounded men in the fore turret came on foot to the dressing stations assisted by bearers."

(Report by Fleet Surgeon S. Yamagishi, Chief Surgeon to the ship.)

The *Asahi*:—"Considering conveyance by hand to be the most convenient, we had previously drilled the bearers in it. However, not only slightly wounded persons, but even those whose injuries were serious mostly preferred to walk to the dressing stations assisted by bearers, so that it was only occasionally that this method of conveyance was employed. Cases conveyed on stretchers numbered six in all, of which two were taken from the port side of the fore bridge, and four from the aft of the upper deck, each through hatches No. 2 and 3. The conveying instruments used for the purpose were field-stretchers and Totsuka stretchers."

(Report by Fleet Surgeon H. Usui, Chief Surgeon to the ship.)

The *Kasuga*:—"Those killed and wounded on the upper deck were speedily taken to the dressing stations by hand or on stretchers, so speedily that the officers on duty in the battery found that all the injured persons on the deck had already been taken away when, after a few minutes of observation of the Russian ship whose fire had caused so many casualties among our men, they returned to survey the scene of the disaster. The men who were injured on the flying bridge were left there for some time longer: they did not attract the notice of the

bearers, who were away to the dressing stations conveying the persons injured on the upper deck. Their attention was called to these men by the officer, second in command of the ship, and a party speedily came to carry the men away. In most of the above cases, hands were chiefly employed in conveyance, but the killed and those seriously injured were all borne off in Totsuka stretchers. No indications of hurry or confusion was to be seen throughout, and we gladly recognized that their long experience since the battle of the Yellow Sea, had given the bearers much skill."

(Report by Staff Surgeon Y. Tachibana, Chief Surgeon to the ship.)

The *Nissuin* :—" In conveying the wounded during the battle, hands and Totsuka stretchers were employed, as was also the case when patients were brought to the dressing stations for operations, or were to be sent back home. The Totsuka stretcher proved the most efficient of all the appliances used and very convenient in going up or down ladders. There was no occasion for calling the ordinary canvas chair into use."

(Report by Staff Surgeon I. Yamaguchi, Chief Surgeon to the ship.)

The *Idzumo* :—" Before going into action, we had decided to use the Totsuka stretcher for conveying all kinds of wounded persons and ten sets of the instrument had been provided beforehand. When the engagement was about to commence, three sets were placed ready for use, in the fore and after parts of the upper and main decks, so that men seriously wounded could be taken off on them speedily and without discomfort. Of twenty-three casualties, two killed and five wounded were conveyed on the stretchers; one killed and two wounded were taken away by hand, and the remaining twelve came on foot to the dressing stations without any help from others."

(Report by Surgeon Inspector Y. Saito, Chief Surgeon to the ship.)

The *Adzuma* :—" As a first step, men wounded on the upper deck were conveyed on Totsuka stretchers or by hand as far as the 3rd hatchway on that deck, and those wounded on the main deck were borne to the 3rd hatchway on that deck on field-stretchers or by hand. At these spots, the wounded were all transferred to canvas chairs, which were let down by means of pulleys into the dressing stations. Those not severely wounded either walked to the stations with-

out help, or were taken thither by hand. The Totsuka stretcher was found in practice to be easily handled, and available in all manner of cases, so we may consider it to be the most suitable of all instruments of conveyance."

(Report by Fleet Surgeon S. Otsubo, Chief Surgeon to the ship.)

The *Otowa* :—" With the exception of one man who was conveyed on a stretcher, the wounded were all brought to the dressing stations by hand. The bearers selected from the regular seamen proved very active and efficient in performing duty during the battle. They had previously been trained in the practice, but the rest (mainly hired " boys ") though working with no less alacrity, failed in agility and speed of performance, mainly owing to the lack of muscular strength."

(Report by Surgeon S. Kusaka, Chief Surgeon to the ship.)

The *Nitaka* :—" The casualties our ship sustained during the engagement were three in killed and wounded, of which one case, heavily injured, was conveyed to the dressing station in the hand of three bearers ; and the corpse of one man killed was conveyed on a Totsuka stretcher, to the aft dressing station by three bearers."

(Report by Surgeon S. Tachikawa, Chief Surgeon to the ship.)

The *Akushi* :—" One person killed and two men too heavily wounded to walk, were conveyed by hand, and one other, seriously injured, was borne on a Totsuka stretcher. In no case of conveyance by hands was the bearing band of canvas made use of. It is evident that in the case of a wounded person, when the pressure of his own weight on the buttock has to be avoided, it is impossible to use a bearing band. Also that an injured person who has lost consciousness has no strength to hold on the bearer. In such cases, the Totsuka stretcher can be used with advantages, for it not only does away with the pressure of the wounded person's own weight on one part of his body, but it serves to fix an injured limb without especially applying a splint to the part."

(Report by Surgeon K. Fujinuma, Chief Surgeon to the ship.)

The *Tsushima* :—" All the wounded, whether seriously so or otherwise, were conveyed by hand. However, in case the wounded after having been once brought to the fore or aft dressing stations had to be removed elsewhere, the field-stretcher or Totsuka stretcher was used. The Totsuka stretcher as compared with the

other was found to be far more handy and manageable, and at the same time, to be beneficial to the wounds themselves.”

(Report by Surgeon T. Imai, Chief Surgeon to the ship.)

The *Hashidate* :—“ The only method of conveyance actually made use of was the hand. One man on the poop deck who had had his left elbow-joint mutilated stood up of his own accord and walked to the dressing station with the assistance of a bearer. Those who were wounded in the neighbourhood of the middle hatch, which was only 16 metres distant from the aft dressing station, walked in with or without assistance.”

(Report by Staff Surgeon H. Sonobe, Chief Surgeon to the ship.)

The *Idzumi* :—“ When casualties occurred on the upper deck, the bearers at once carried them off to the dressing stations on Totsuka stretchers. Some hours later, many men were killed or wounded on the fore tops. The bearers at once hastened up to the scene, gave first aid, and let the wounded down to the upper deck in canvas chairs. On the upper deck, they were transferred to Totsuka stretchers and conveyed to the dressing stations.”

(Report by Surgeon M. Takeda, Chief Surgeon to the ship.)

SECTION II. TREATMENT OF WOUNDS.

I. Treatment of the Wounded on the Spot of Injury.

While an engagement is going on, the surgeons, sick berth stewards and attendants, together with other supplementary assistance such as may be found on board each ship, are placed ready in the dressing stations for the arrival of the wounded. At the same time, there are posted about the ship at suitable points, bands of bearers,—writers, stewards and civilian employés, whose duty is to carry the wounded into the dressing stations. The bearers have been previously instructed and drilled in giving temporary relief to such persons as are seriously wounded or who are suffering from heavy hæmorrhage before taking them to the dressing stations. When many heavy casualties occur at one and the same time, the gun-crews and other men on the disengaged side of the ship are called in to assist in the conveyance of the wounded. These men have also previously received a

general idea of methods of conveyance and of temporary relief. Every bearer is provided with a bag containing first-aid packages and a rubber tube for tourniquets.

First-aid Packages :—The first-aid packages hitherto used in our Navy were always small ones. At the first attack on Port Arthur, it was found that although such packages were large enough for small wounds such as those produced by bullets, for large wounds as e. g. those inflicted by fragments of shell, they were too small. This led Surgeon Inspector S. Sudzuki, attached to the Combined Fleet, to offer a suggestion that a special kind of first-aid package should be adopted for use on ships, the small ones hitherto employed being reserved for the use of landing parties called upon to take part in small arms engagements. In compliance with his proposal, Dr. Totsuka, Director of the Sasebo Naval Hospital, prepared two kinds of first-aid packages, which for some time he supplied to each ship in our Navy wherever requested to do so by the chief surgeon of that ship. Later, Baron Y. Sancyoshi, Chief of the Bureau of Medical Affairs, in the Navy Department, recognized the necessity of unifying the manufacture of the packages in all our naval hospitals, and on the 23rd August, 1904, he gave instructions that the first-aid packages thereafter to be used in our ships should be gauze 0.606 metres in length, medicated with corrosive sublimate, and folded to a size 0.121 metres square. Four pieces of these gauzes being placed one upon another should be enveloped in a piece of air-tight tissue paper, accompanied by a piece of triangular bandage and one safety-pin, all to be put in a paper package varnished with *Shibu* (juice of the unripe persimmons) and sealed with disinfected paste. The first-aid packages for the use of landing parties were to be the same as had hitherto been employed, though with slight local variations as made at the different medical depôts in the Navy. In spite of these local variations, however, the packages as a rule consist of three pieces of gauze 0.076 metres in length and 0.061 metres in width, medicated with corrosive sublimate, and each accompanied by a piece of triangular bandage. The triangular bandages contained in the small first-aid packages had often proved to be not a little inconvenient, because of their being occasionally manufactured differently, in violation of the established regulations. However, it was now

definitely settled that the base of the triangle should be 1.424 metres in length, the triangle being isosceles with a right angle at the apex.

Bearers carried with them four or five of the first-aid packages mentioned above in a canvas bag hung over their shoulders by a strap. Not only so, but such bags were also distributed before an action to the fore and aft bridges, the upper, main, and lower decks, the tops, engine rooms and sometimes the turrets, so as to be ready for use in any sudden emergency before the bearers could arrive on the scene.

The Indian Rubber Tube for Tourniquets:—It was a middle-sized rubber tube 1.758 metres in length. Some of the tubes were furnished with a hook at one end, and a ring at the other, for increased facility of application. Ordinary tubes were provided in the most cases and the number of tubes kept ready on the ships varied: in some ships each bearer was equipped with one, while in others only three or four pieces tubing were provided on the upper deck.

Shell-wounds are, as a rule, attended with a serious mutilation of the soft tissues, and the hæmorrhage in consequence is comparatively small in proportion to the size of the wound. As Surgeon-General Baron Y. Saneyoshi, Chief of the Bureau of Medical Affairs, had advised us at the beginning of the war, it was found that the surface of a shell wound spontaneously helped to arrest the hæmorrhage as soon as the compresses pressed it together, and in all our experiences during the war we found but few cases in which it was necessary to employ indirect methods of arresting hæmorrhage, such as, e. g. the binding of a wounded limb with a tightly drawn rubber tube. It need scarcely be said that, if this last-mentioned method be abused, it is liable to entail consequences of a very serious nature, and that consequently strict caution must be exercised in its employment. As a matter of fact, however, the dressing stations on board a ship can be easily reached from almost any part of it, and it is very seldom that this method of arresting hæmorrhage has to be employed by bearers or others.

We shall now give the summaries of reports sent by the chief surgeons on board our ships, with regard to the actual conditions of temporary relief rendered to the wounded in them.

The First Attack on Port Arthur.

The *Shikishima* :—“ It had been arranged that all the members of the crew on the disengaged side should act as bearers of the wounded, so that every member of the ship's company was liable to be a bearer. The whole crew had previously been drilled in methods of conveyance, by hand and otherwise, and in the use of gauze packages, triangular bandages, etc. Among other things, they had been ordered strictly to observe the following rules :—

1. Never under any conditions to touch the surface of a wound with a finger or fingers.
2. To cover the surface of a wound at once with the red gauze in the first-aid packages, applying the side of the gauze not touched by the fingers.
3. To bind the wound tightly over the red gauze with a triangular bandage.
4. To convey the wounded into the surgeries as quickly as possible.”

(Report by Fleet Surgeon T. Ikeda, Chief Surgeon to the ship.)

The *Fuji* :—“ It would be utterly impossible for bearers to examine the nature of wounds while the fight is going on briskly around them, and indeed they often fail in their hurry to make use of even the simplest supplementary appliance, such as, e.g. the four tailed carrying-band. Consequently, although the men have been pretty well trained previously in the art of giving temporary relief, they have practically been found not to be able to avail themselves of their knowledge during the rush of the engagement. Moreover, it is not always necessary to give the wounded such relief on the spot. If the bearer well understands how to tie up a mutilated limb at its upper part in order to arrest bleeding, he may be said to have done all a bearer ought to do.”

(Report by Fleet Surgeon R. Kido, Chief Surgeon to the ship.)

The Battle of the Yellow Sea.

The *Kasuga* :—“ Bearers drawn from writers, stewards, cooks, boys, barbers, etc., most of whom are lacking in mental culture and consequently in presence of mind, seem liable to get excited and confused by the sight of wounds and blood. In my opinion, therefore, it is not sufficient for these men to be previously trained in the methods of conveyance, of temporary relief only. It seems very

advisable to familiarize them with surgical ideas by allowing them to assist in the surgical operations performed on the ship at ordinary times, or to attend and watch such operations and other medical examinations, whenever such attendance does not interfere with the discharge of their proper duties. Otherwise, I fear that another emergency like the late war may chance to find these men quite worthless, even for a little temporary bandaging.”

(Report by Staff Surgeon Y. Tachibana, Chief Surgeon to the ship.)

The *Nissin* :—“In an actual battle, temporary relief need not necessarily be given to the wounded by regular bearers. All the men on the disengaged side of the ship who have at the moment nothing particularly to do in the line of their duty, have the duty to assist in conveying the wounded according as the occasion requires them. There were, indeed, very few cases in which bearers themselves had given the wounds a temporary dressing before bringing the injured person to the dressing stations; in most cases they carried the persons straight in, without disturbing the wounded parts. There were also many instances in which slightly injured persons had their wounds dressed on the spot, and held on to their posts in the battle. If we except such cases as a mutilated wound in a limb, or the spouting of blood from a wound, experience has shown that it is always far better to convey the wounded into the dressing stations, as soon as possible rather than lose any time on deck in giving an imperfect dressing to the wounds. I do not mean, however, that we may safely neglect the previous training of bearers in the art of temporary relief.”

(Report by Staff Surgeon Y. Sudzuki, Chief Surgeon to the ship.)

The Naval Battle of Ulsan.

The *Idzumo* :—“The bearers on board the *Idzumo*, drawn from the bandmen, did not fail to give temporary dressing to the wounded at once before carrying them to the dressing stations, and not a single wounded man was brought in with the surface of his wound exposed; this act on the part of the bearers was worthy of praise. The only fault against which they ought to have guarded was the excessive tightness with which they applied the dressings, thus sometimes causing a congestion of blood in the part, whereby the original character of the wounds was found to have been lost by the time the persons were brought

to the dressing stations. Hence, it seems an important point at once to examine the condition of the dressing and to ascertain whether there exists hæmorrhage or not, as soon as a wounded person is brought to the dressing stations.”

(Report by Staff Surgeon K. Mochidzuki, Chief Surgeon to the ship.)

The *Takachiho* :—“ In a ship like the *Takachiho* in which the fore and aft dressing stations are located so conveniently for the conveyance of the wounded, it is very advisable for the bearers to carry the wounded persons as quickly as possible to the dressing stations without giving them temporary relief. This is in order to avoid the danger of the wounds being touched and soiled with the fingers or hands of the bearers which are apt to be unclean, no matter how perfectly sterilized the gauze packages may be, and also to avoid the loss of time spent in dressing the wounds. I had therefore ordered the bearers previously, to convey the wounded to the dressing stations as fast as possible, except in cases attended with heavy hæmorrhage. The nearness to the dressing stations of the scenes of injury enabled the bearers to act as they had been instructed.”

(Report by Surgeon S. Kazu, Chief Surgeon to the ship.)

The Battle of the Japan Sea.

The *Mikasa* :—“ The eight wounded persons brought to the dressing stations on Totsuka stretchers, and the seventeen others who, in spite of serious injuries, came into the dressing stations on foot leaning on the shoulders of bearers, all had had their wounds dressed on the scenes of injury. An able seaman who sustained a mutilated wound in the right forearm had the bleeding arrested with a rubber tube by the bearers on the spot, and was thus brought to the dressing stations, where the tube being removed, the wound was found to be still bleeding, so the tube was applied again, until ligature was performed on the parted blood vessels.”

(Report by Fleet Surgeon T. Saigo, Chief Surgeon to the ship.)

The *Asahi* :—“ The summarised suggestions which I gave the bearers at the beginning of the battle urging them to be vigilant in affording temporary relief to the wounded were as follows :—They should never touch the wound with the hands and fingers ; in cases of serious injuries attended with hæmorrhage, they should cover the wounds with first-aid packages and then put compresses over

them; those whose wounds were not accompanied by heavy bleeding should be taken at once to the dressing stations without any attempt being made to give the wounded persons temporary relief: and if many cases of heavy casualties should occur at one time, the wounded persons should be conveyed as impartially as possible to the fore and dressing stations. I emphatically told the bearers never to touch a wound; for in our vessel, the dressing stations being situated near the upper deck, there was no need to give temporary dressings under a hazardous hail of shells and shell-fragments."

(Report by Fleet Surgeon H. Usui, Chief Surgeon to the ship.)

The *Idzumo* :—"The bearers on board the ship, having been put through the drills 32 times since January of the year 1905, acted on this occasion with admirable courage and smartness. They proved especially satisfactory in their way of applying the rubber-tube binding to cases which had sustained a mutilated wound in the limbs, or to those who had arteries injured. Indeed, there was one instance of simple fracture of the femur, to which they also applied this method of binding, which, needless to say, was a vain labour. But for this blunder on their part at the moment of hurry and bustle, they were not much to blame. It was also an unavoidable circumstance that although operation was perfect as far as the rubber-tube binding was concerned, yet owing to the injury of large vessels the wounded persons already showed all the symptoms accompanying a heavy loss of blood, when the bearers came to their rescue."

(Report by Surgeon Inspector Y. Saito, Chief Surgeon to the ship.)

The *Adzuma* :—"As previously instructed, the bearers removed the wounded to the nearest place of comparative safety (if such place could be found), and there covered the wounds with the dressing materials contained in the first-aid package, followed by the application of a compressing bandage for the purpose of arresting haemorrhage in a direct way. As regards the cases attended by profuse haemorrhage, the bearers had been told to dress the wound and at the same time to bind the part above the wound as tightly as possible with the rubber-tube, with which each bearer was provided. But it was very exceptional for such a step to be actually taken by the bearers."

(Report by Staff Surgeon S. Otsubo, Chief Surgeon to the ship.)

The *Otowa*:—"Speedy conveyance of the wound to the dressing stations was the chief principle upon which the bearers were told to act in dealing with those persons. Further, with a view to avoiding the danger of soiling wounds the bearers had been forbidden to touch the surface of the wounds. They were permitted to give temporary dressing to the wounds only when the dressing stations were filled with patients, or in the case of persons wounded at a place whence speedy removal was difficult, such as an engine room, or a top. Therefore, on the present occasion the wounded persons had the happiness of being soon placed under the care of a surgeon."

(Report by Staff Surgeon S. Kusaka, Chief Surgeon to the ship.)

II. The Treatment of the Wounded in the Dressing Stations during and after the Battle.

1. Equipments of the Dressing Stations.

All the vessels are usually provided with a dispensary and operating room and a sick bay.

This accommodation is generally to be found on the main deck; a very unsafe place in the time of a war, as it lacks adequate protection against the enemy's fire. For this reason, the dressing stations of the big men-of-war were arranged on their lower decks so as to be comparatively safe in time of war. With small ships, such as second-class cruisers or below, very few have enough room to allow of dressing stations below the water-line, which is naturally less dangerous; accordingly, with a view to the reception of the wounded and the facilities of their conveyance, the ward rooms were set apart as places for dressing stations. Our original idea was to provide two or more such dressing stations on each ship at places easy for access for the bearers from any part of the ship, and satisfying other requirements, but it proved to be quite impossible to obtain such places at the same time easy of access and fully equipped with all the conditions of light, ventilation, water-supply, etc.

The Number of Dressing Stations:—At the naval engagement fought on September 17, 1894, near Hai-yan Island the warship *Hiyei* had the ward room in the 5th compartment of the lower deck set apart as the only dress-

ing station. A hostile shells, 30.5-c.m. in diameter, struck the room and burst, killing Surgeon T. Miyake, Chief Surgeon of the ship, Assistant Surgeon C. Murakoshi and five others of the sick berth staff and wounding three others. The shell also killed two of the wounded who were at the time receiving treatment in the room, and rewounded another. It further destroyed all the medical instruments and dressing material in the room. In consequence of this disaster all the persons killed or wounded on that occasion had to be left, as they were, without receiving any relief or care until the ship returned to the temporary base of operations. Learning wisdom from this bitter experience, we made it our established policy during the late war to have at least two dressing stations provided on each vessel from the biggest battle-ships down to the smallest destroyers and also to have medical materials kept distributed in several places so as to provide against the chances of their total destruction at any single moment.

Position :—The battle-ships *Asahi* and *Shikishima* had each two dressing stations respectively on the fore and aft part of the lower deck, throughout the war. The *Mikasa*, at the beginning of the war, had three dressing stations, one in the ship's operating room on the main deck and another in the 2nd compartment of the same deck, the third being in the blacksmith's workshop on the lower deck. After the naval engagement of February 9th, the two dressing stations on the main deck were abandoned, and a new one fitted out on the lower deck. The armoured cruisers *Idzumo*, *Adzuma*, *Yakumo*, *Tokiwa*, *Asama*, and *Nisshin* all had their dressing stations on the lower decks. In the *Iwate* and the *Kasuga* only, the aft dressing stations were placed on the main deck at first, the *Iwate* afterwards transferring hers to the lower deck. In battle-ships and armoured cruisers, the dressing stations were established as has been stated, within the limits of armoured protection. Furthermore, most of the dressing stations were protected by a coal bunker on each side, so that nothing was left undone so far as the protection of the sides was concerned. However, had a hostile shell descended with a large angle of descent from above forcible enough to strike through the upper and main decks, the dressing stations would have been in great jeopardy. Fortunately, none of the above-mentioned vessels witnessed a disaster of this kind. In vessels inferior to the 2nd-class cruisers, two or more dressing

stations were also established by appropriating the ward room and the warrant officers' mess; or sometimes a part of the torpedo room, the crew space, or a part of the upper deck. In most of the destroyers, the officers' room was used for the chief dressing station and a part of the petty officers' room for a subordinate dressing room.

At the battle of the Japan Sea, it was provided on small vessels of the unarmoured type that before any casualty occurred on board, the members of the medical staff should take shelter in the parts below the protective deck, and in some vessels it was agreed upon that the medical corps even if they did not take shelter in other places from hostile shells, should manage not to assemble together in the dressing stations. In this battle, it happened that the *Kasagi* had one of her dressing stations destroyed by a hostile shell, but there resulted no worse injuries to the medical staff than a few cases of slight wounds.

Lighting:—Wherever dressing stations may be placed on board a ship, there is, during a battle, no alternative for obtaining light but from some artificial source. In a big man-of-war five or more incandescent electric lights of 16 or more candle-powers were furnished in each of the dressing stations, and of these two or three were movable. There were some ships in which a certain number of electric lights of 50 or more candle-power was provided with in order to get sufficient light. With the exception of old vessels like the *Tsukushi*, all the ships—even vessels inferior to the 2nd-class cruisers—were equipped with electric lights. During battles, with a view to providing against the destruction of the dynamo and wire, a certain number of candles and candle-sticks, or of acetylene lamps, was kept ready for use.

Ventilation and Temperature:—The ventilation conditions in the dressing stations during a battle cannot of course be said to be satisfactory—and this is especially the case with battle-ships and armoured cruisers. As, however, all vessels have to run at high speed during an engagement, the motion of air blowing in through the gun ports, ammunition scuttles etc., is very considerable, and the ventilation of the regions below the lower deck is consequently not so bad as might be expected. Even in cases when the electric fans have happened to cease working, more or less change of air has still been found to be going on.

One great defect of the dressing stations on the lower deck is the unusually high temperature caused by proximity to the engine room, etc. At the battle of the Yellow Sea fought on August 10th, there were not a few dressing stations in which the temperature stood at about 100 degrees, the floors being so hot to the feet that they had to be covered with gratings. It was also found necessary to provide the receiving station for the wounded with ordinary fans, electric fans, or the like.

Water-Supply :—It need scarcely be mentioned that a large quantity of sterilized as well as of ordinary water is required in the dressing stations. In our ships at the beginning of the war, proposals were made to equip the dressing stations with big tanks or to bring water to them in pipes, but the dressing stations which were all of a temporary nature could not be ideally fitted out in the short time at our disposal, so we had to be content with providing casks or cans for holding the water. In vessels not furnished with a sterilizer, some simple expedients for temporary use were provided. Then experience taught us that it was easy to produce sterilized water, but very difficult to find means of preserving it. In practically most of our ships it was kept in old *sake* casks, barrels, cans, etc., collected for the purpose.

Cleaning of Dressing Stations :—The dressing stations on each ship were thoroughly swept and washed everytime they were to be opened for service. This was especially the case when the bathroom for the seamen or stokers had to be appropriated for dressing stations. They were invariably subjected to a wholesale disinfection. The processes of disinfection were in brief as follows :—

1. To rub the surface of the ceiling and walls with soap and then wipe it clean.
2. To flush the drainage exits so as to prevent the accumulation of stagnating refuse.
3. To wipe clean the surface of the ceiling, walls and the decks with a solution of carbolic acid 3 per cent strong.
4. The process given in (3) is specially to be applied to dressing stations provided with canvas curtains and hangings.

5. While a battle is going on, carbolic acid of the strength of 3 per cent is sprinkled over the decks and walls so as to lay the dust.

The Articles provided in the Dressing Stations :—The furniture, instruments, and other things provided in the dressing stations were chiefly as follows :—

Operating Table :—In some of the battle-ships and armoured cruisers, the spaces which were designed for appropriation as dressing stations had previously been furnished, on one side of them, with an iron operating table with movable legs on india-rubber castors. In other vessels, an operating table specially made for the purpose was placed at a suitable spot in the dressing station, which, covered with a blanket and Mackintosh sheet proved a proper instrument for its purpose. In vessels inferior to the 2nd-class cruisers, tables in the ward rooms or warrant officers' mess were temporarily diverted for the purpose, and in many others a couple of chests placed longitudinally were made to serve the purpose. Wash basins, water-vessels, refuse-receptacles, etc.,—all indispensable things—had naturally to be restricted in number on account of the small area of dressing stations. We give below a list of the furniture etc. provided on board the *Mikasa* at the battle of the Yellow Sea.

FORE DRESSING STATION.

Article.	Number.	Use.
Big glass bottle.....	1	For keeping drinking water.
Vessel for keeping fresh water	1	For washing hands.
Iron-bucket.....	1	For keeping water for sundry uses.
Enameled wash basin.....	1	For washing hands.
Ditto	1	For keeping a solution of corrosive sublimite 0.1 per cent strong.
Empty salt meat cask	1	For receiving general refuse.
Blanket	1	For covering the operating table.

AFT DRESSING STATION.

Article	Number.	Use.
Water-vessel	1	For keeping drinking water.
Iron-buckets	3	For keeping water for sundry uses.
Enameled wash basin.....	1	For washing hands.
Ditto	1	For keeping a solution of corrosive sublimate 0.1 per cent strong.
Empty salt meat cask	1	For receiving general refuse.
Blanket	1	For covering the operating table.

Surgical and Medical Articles.

The choice of surgical and medical articles varied more or less with the ship, as did also their quantity. But every medical article was invariably subjected to disinfection before it was stored on a ship. Dressing materials must be stored in large quantities, to suffice for all emergencies. We shall now, for the reader's information, give a tabular view of the surgical and medical articles (with quantities and amounts) as provided in the dressing stations on board the *Mikasa* at the battle of the Yellow Sea, and the *Tsushima* and the destroyer *Oboro* at the battle of the Japan Sea, and also of the surgical instruments actually employed and articles actually consumed on the *Mikasa* and *Tsushima*.

LIST OF ARTICLES PROVIDED FOR THE DRESSING STATIONS OF THE *Mikasa* AT THE BATTLE OF THE YELLOW SEA.

Fore Dressing Station.			Aft Dressing Station.		
Articles Provided. (Asterisks denote articles actually employed.)	Number.	Use.	Articles Provided. (Asterisks denote articles actually employed.)	Number.	Use.
*General operating case	1	Of which only bone-cutting forceps, (Liston's) amputating-saw and knife were used in performing operation on the mutilated and contused wounds of the lower limbs.	*Operating case.....	1	Only ligature and some others were used in performing amputation on the lower limbs.

Articles Provided. (Asterisks denote articles actually employed.)	Number.	Use.	Articles Provided. (Asterisks denote articles actually employed.)	Number.	Use.
Esmarch's Bandage.	1		* Esmarch's Band- age.....	1	Used only in the amputation of the lower limb.
*Chatelaines	2	Used for treating wounds.	*Chatelaines	2	Used for treating wounds.
Rubber syringe.....	1	For bathing the eye with a lotion of boracic acid.	Rubber syringe.....	1	
*Dressing trays.....	2	Used for treating wounds.	*Dressing tray	1	Used for treating wounds.
Irrigator.....	1		Irrigator	1	
*Instrument trays...	2	For keeping steri- lized surgical instru- ments in.	Instrument tray ...	1	Scalpel 1, sharp pointed curved bist- oury 1, forceps 2, grooved probe 1, hae- modynamic forceps 3, artery hook 1, spoon 1, hypodermic syringe 1.
*Brass basins.....	2	Used in treating wounds.	*Brass basin	1	Used for treating wounds.
Tongue depressor ...	1		Tongue depressor...	1	
*Brass pitcher	1	Water for drinking and medicine.	*Brass pitcher	1	Water for drinking and medicine.
*Hypodermic syr- inge	1	For injecting cam- phorated ether.	*Hypodermic syr- inge	1	For injecting cam- phorated ether or a lotion of morphine.
*Mackintosh sheet for operating table.	1	To cover the tem- porary operating table.	Mackintosh sheet for operating table.	1	For covering the temporary operating table.
*Rubber pillow.....	1	To be used during an operation.	*Rubber pillow.....	1	To be used during an operation.
*Shears	2	For cutting and trimming clothes and dressings.	*Shears	2	For cutting and trimming clothes and dressings.
*Operating gowns...	6	3 for surgeons, 1 for sick berth steward, 1 for sick berth atten- dant, 1 for assistant.	*Operating gowns ..	5	2 for surgeons, 1 for sick berth steward, 1 for sick berth atten- dant, 1 for assistant.

*Tape measure	1		Tape measure.....	1	
			*Vessels (for holding articles for external application.).....	2	1 for corrosive sublimate solution poultice, 1 for boracic acid solution poultice.

CONSUMABLE ARTICLES.

Articles.	Quantity originally provided. Quantity consumed.	Use.	Articles.	Quantity originally provided. Quantity consumed.	Use.
*Absorbent cotton wool ... <i>Momme</i>	{ 200 500	For dressing wound.	*Absorbent cotton wool ... <i>Momme</i>	{ 200 600	For dressing wounds
*Absorbent gauze <i>Tan</i>	{ 8 13	" " "	*Absorbent gauze <i>Tan</i>	{ 5 15	" " "
Cotton wool <i>Momme</i>	{ 50 —	" " "	*Cotton wool <i>Momme</i>	{ 100 100	" " "
*Roller bandages of cotton cloth No.	{ 25 65	" " "	*Roller bandages of cotton cloth No.	{ 20 60	" " "
*Triangular bandages..... No.	{ 10 10	" " "	*Triangular bandages..... No.	{ 10 10	" " "
*Lint..... <i>Shaku</i>	{ 3 5	Steeped in a solution of picric acid, and applied chiefly to burns.	*Lint <i>Taw</i> <i>Shaku</i>	{ 1 3	Steeped in a solution of picric acid, and applied chiefly to burns.
Oiled paper ... No.	{ 5 5	Placed under a wounded while dressing the wound.	*Oiled paper Sheets	{ 5 10	Placed under a wounded part while dressing the wound.
Cotton cloth... <i>Tan</i>	{ 2 1	Used in dressing wounds.	*Cotton cloth <i>Tan</i>	{ 2 2	Used in dressing wounds.
*Flexible wooden Splints (large) No.	{ 15 —		*Flexible wooden splints (large) No.	{ 12 2	Used in a fracture of an upper limb.
Flexible wooden splints (medium) No.	{ 15 1	Used in a fracture of an upper limb.	Flexible wooden splints (medium) No.	{ 10 —	
*Flexible wooden splints (small) No.	{ 20 —		Flexible wooden splints (small) No.	{ 12 —	

Articles.	Quantity originally provided. Quantity consumed.	Use.	Articles.	Quantity originally provided. Quantity consumed.	Use.
Perforated zinc splints (large) No.	{ 5 —		*Perforated zinc splints (large) No.	{ 3 1	Used in the case of a fracture of the tibia.
Perforated zinc splints (medium) No.	{ 5 —		Perforated zinc splints (medium) No.	{ 3 —	
Perforated zinc splint (small) No.	{ 5 —		Perforated zinc splints (small) No.	{ 3 —	
Pins No.	{ 30 —		Pins No.	{ 30 —	
*Medicine cups No.	{ 2 —	For administering liquid medicine or other fluids.	*Medicine cups No.	{ 3 —	For administering liquid medicine and water.
*Drinking cups No.	{ 2 —	For drinking fluids to quench thirst.	*Drinking cups No.	{ 2 —	For drinking water to quench thirst.
*Cotton wipers No.	{ 100 70	To wipe or cover wounds.	*Cotton wipers No.	{ 30 30	To wipe or cover wounds.
Rubber tubes <i>Shaku</i>	{ 10 —	Used for tourniquet.	*Rubber tubes <i>Shaku</i>	{ 8 —	Used for tourniquet.
*Rubber feeding tubes No.	{ 2 —	For seriously wounded persons to suck water, liquid medicine through.	*Rubber feeding tubes No.	{ 3 —	For seriously wounded persons to suck water, fluid food, and liquid medicine.
*Soap No.	{ 1 1		*Soap No.	{ 1	
*Nail brushes No.	{ 2 —		*Nail brush ... No.	{ 1 —	
*Towels ... Sheets	{ 3 3	For wiping hands.	*Towels ... Sheets	{ 2 2	For wiping hands.
Brushes No.	{ 3 —	For applying medicine externally.	Brushes No.	{ 3 —	For applying medicine externally.

*Pencil No.	{ 1 1		*Pencil No.	{ 1 1	
*Matches.....Box.	{ 2 1		*Matches ... Box.	{ 2 1	
*Candles No.	{ 5 2	Used when the electric lights were out owing to the interruption of the electric wire or conductors.	*Candles No.	{ 12 4	Used when the electric lights were out owing to the interruption of the electric wire or conductors.
First-aid packages No.	{ 100 60	For dressing wounds.			
Felt..... <i>Shaku</i>	{ 3 —				
Paraffin paper Sheets	{ 10 10				
Chamois leather <i>Shaku</i>	{ 1 —				
Cotton gauze packages ...No.	{ 100 —				
Roller bandages of cotton gauze No.	{ 20 —				

DRUGS.

Articles.	Quantity originally provided. Quantity consumed.	Use.	Articles.	Quantity originally provided. Quantity consumed.	Use.
*3% boracic acid solution. Gramme	{ 1,800 450	Used for cleansing the wounds in the eye, nose, mouth and thereabout.	3% boracic acid solution,gramme	{ 600 600	Used for cleansing the wounds in the eye, nose, mouth and thereabout.
2 % carbolic acid solution.....Do.	{ 1,350 —		2% carbolic acid solution.....Do.	{ 1,200 —	
5 % carbolic acid-solution.....Do.	{ 450 —		5% carbolic acid solution.....Do.	{ 600 —	

Articles.	Quantity originally provided. Quantity consumed.	Use.	Articles.	Quantity originally provided. Quantity consumed.	Use.
*0.1 % corrosive sublimate solution ... Gramme	{ 1,800 1,800	Used for cleansing the margins of wounds, the hands and fingers of members of the dressing station, & the Mackintosh sheets.	*0.1 % corrosive sublimate solution ... Gramme	{ 3,600 3,600	Used for cleansing the margins of wounds, the hands and fingers of members of the dressing station, & the Mackintosh sheets.
0.6 % sterilized salt water...Do.	{ 1,350 —		0.6% sterilized salt water...Do.	{ 1,200 —	
*1% picric acid solution.....Do.	{ 900 450	Used for burns.	*1% picric acid solution.....Do.	{ 1,200 300	Used for burns.
Schleich's fluid	{ 50 —		Schleich's fluid	{ 100 —	
1% Liquor Morphinae Hydrochloridi.....Do.	{ 100 —		*1% Liquor Morphinae Hydrochloridi.....Do.	{ 60 4	
*Ointment of boric acid...Do.	{ 500 200	Used for burns and scalds.	Ointment of boric acid	{ 500 —	
*Natrium chloride with corrosive sublimate ...Do.	{ 50 24	As supplement to corrosive sublimate solution.	*Corrosive sublimate with natrium chloride	{ 30 15	As supplement to corrosive sublimate solution.
*Camphorated ether	{ 50 1	One gramme used for injection for a person.	*Camphorated ether..... Do.	{ 30 4	Used for injection for 2 patients, 2 gramme per head.
Chloroform ...Do.	{ 450 —		*Chloroform...Do.	{ 450 50	Used for patient in dying agony
*Brandy Do.	{ 650 200	Given to wounded persons.	*Brandy .....Do.	{ 550 200	Given to wounded persons.
5% watery solution of cocaine hydrochloride	{ 60 —		Pure carbolic acid	{ 450 —	
Sesame oleum. Do.	{ 1,350 —		Sesame oleum..Do.	{ 450 —	
Adhesive rubber plaster ... <i>Shaku</i>	{ 6 1	Used in coaptating small wounds.	Adhesive rubber plaster ... <i>Shaku</i> .	{ 3 2.5	Used in coaptating small wounds.
			Iodoform .....Do.	{ 25 —	

Remarks:—The consumed quantities of each article mentioned in the foregoing list show those actually used up in the dressing stations of the ship during the battle. Articles and quantities consumed after actual engagement in the operating room and at the time of changing dressings are not included therein, nor are there comprised those articles used for the patients who for the first time received treatment on and after the day following the battle under consideration.

**LIST OF THE SURGICAL & MEDICAL ARTICLES PROVIDED IN THE
DRESSING STATIONS OF THE *Tsushima* AT THE
BATTLE OF THE JAPAN SEA.**

Articles.	Dressing Station.		Quantity consumed.	Articles.	Dressing Station.		Quantity consumed.
	Fore.	Aft.			Fore.	Aft.	
General operating case .....No.	1	—	—	Tourniquets ...No.	—	5	—
Silver catheter...Set.	1	—	—	Esmarch's bandage.....No.	1	—	—
Ophthalmic instrument case.....No.	1	—	—	Brass pitcher ...No.	—	1	—
Shears.....Pair.	1	1	—	Glass bobbin ...No.	1	1	—
Portable surgical bag.....No.	—	1	—	Medicine cup...No.	1	1	—
Instrument trays No.	2	1	—	Brass basins.....No.	2	1	—
Operating case...No.	—	1	—	Rubber tube for tourniquet .....No.	—	2	—
Hypodermic syringe No.	1	1	—	Scissors for cutting tin-plate .....Pair.	1	—	—
Tape measure ...No.	1	—	—	Chatelaine .....No.	—	1	—
Pillow (for patients' use) .....No.	—	1	—	Cork screw No.	1	—	—
Operating gowns No.	5	3	—	Mackintosh sheet for operating table...No.	1	—	—
Pins .....No.	100	50	10	Operating table...No.	1	1	—
Soap .....No.	—	1	—	Iron spatula.....No.	1	—	—
Towels .....Sheet.	2	2	—	Flexible wooden splints (large, medium & small) zinc splint included .....No.	7 (each)	6 (each)	Large ones 2; medium & small one, 1 each.
Ordinary cotton wool..... <i>Momme</i> .	200	200	500	Lint <i>Tar</i> .	1	1	2
Paraffin paper Sheet.	20	20	30	Gauze packages No.	20	20	—
Oiled paper .....Do.	10	5	—	Rubber feeding tube No.	1	1	—

Articles.	Dressing Station.		Quantity Consumed.	Articles.	Dressing Station.		Quantity Consumed.
	Fore.	Aft.			Fore.	Aft.	
Triangular band-ages..... Sheets.	20	10	5	Absorbent cotton wool <i>Momme.</i>	300	300	300
Dressing and band-age box .....No.	1	1	—	Absorbent cotton gauze..... <i>Tan.</i>	15	15	—
First-aid pack-ages .....No.	50	50	39	Tumbler .....No.	1	1	—
Nail brushes .....No.	2	1	—	Operation pillow, rubber .....No.	1	—	—
Cotton cloths... <i>Tan.</i>	20	15	16	10% camphorated ether ...Gramme.	30	10	—
2% carbolic acid solution...Gramme.	5,000	500	450	Brandy .....Do.	650	650	—
Iodoform .....Do.	100	—	—	0.1% corrosive sublimate solution, Do.	1,000	2,000	35,000
Mixture of methyl alcohol with alcohol (1: 10) ...Do.	900	250	300	Adhesive plaster, rubber..... <i>Shaku.</i>	3	—	1
Chloroform .....Do.	120	—	—	2% boric acid solution.....Do.	900	450	—
Sesame oleum ...Do.	900	450	80	1% liquor morphinae hydrochloridi...Do.	30	10	5
1% picric acid solution .....Do.	500	500	—	5% watery solution of cocaine hydrochloride.....Do.	50	30	10
Sterilized water, Do.	25,000	10,000	75,000	Acids salicylic & boric, mixed...Do.	250	250	50
Spirit.....Do.	450	450	—	Candles.....No.	A certain number.	A certain number.	—
Blanket .....No.	30	20	—	Matches .....Box.	2 boxes	A certain number.	—
Case paper (diagramatic figures, from No. 1 to No. 6—18 sheets in all)...Set.	3	2	5	Japanese paper ruled (several kinds) .....quantity.	A certain quantity.	—	—
White gowns for patients (single and quilted).....No.	5 each	5 each	—	Stretcher .....No.	1	—	—
Girdles for patients .....No.	5	5	—	Japanese ink case .....No.	1	1	—
				Michel's forceps .....No.	1	1	—
				Wound clamps...No.	—	—	20

LIST OF THE ARTICLES PROVIDED IN THE
DRESSING STATIONS OF THE DESTROYER *Oboro* AT
THE BATTLE OF THE JAPAN SEA.

Articles.	Dressing Station.		Articles.	Dressing Station.	
	Fore.	Aft.		Fore.	Aft.
Operating case.....No.	1	—	Glass bobbin .....No	—	1
Operating gown .....No.	1	1	First-aid packages.....No.	10	10
Silver catheter.....Set	—	1	Pins.....No.	20	20
Michel's forceps.....No.	1	—	Medicine cup.....No.	1	1
Instrument tray .....No.	1	1	Absorbent cotton wool .....Momme	200	200
Mackintosh sheet for operating table .....No.	1	1	Lint .....Tan	1	—
Bandage and dressing box .....No.	1	1	Roller bandages of cotton cloth .....No.	10	10
Auriscopes .....No.	—	1	Camphorated ether, Gramme	50	50
Shears .....Pair	1	—	Soap .....No.	1	1
Brass basin .....No.	1	—	Case paper.....Sheets	18	18
Brass pitcher .....No.	1	—	Paraffin paper .....Do.	5	5
Drop tubes with India rubber cap .....No.	1	1	Wound clamps .....No.	10	10
Sesame oleum ...Gramme.	450	—	Flexible wooden splints (large, medium and small sized) .....No.	15	15
1% picric acid solu- tion .....Do.	600	600	Oiled paper..... Sheets	2	2
Dressing tray .....No.	1	1	1% watery solution of cocaine hydrochlo- ride .....Gramme.	20	20
Silk thread .....Momme	1	1	Vaseline .....Do.	—	450
Nail brush .....No.	1	1	Rubber adhesive plas- ter.....Shaku	3	3
Towel .....No.	1	1	0.2% watery solution of strychnine hydrochlo- ride .....Gramme.	10	10
Absorbent gauze .....Tan	5	5	Sterilized water ...Bottles	2	2
Cotton cloth .....Do.	1	1	2% carbolic acid solu- tion .....Gramme.	600	600

Articles.	Dressing Station.		Articles.	Dressing Station.	
	Fore.	Aft.		Fore.	Aft.
Triangular bandage, Sheets	5	5	1% liquor morphinae hydrochloridi ...Gramme	10	10
Roller bandages of cotton gauze .....No	10	10	0.1% corrosive sublimate solution .....Gramme	600	600
Brandy.....Gramme	300	300	Drinking water ...Bottles	2	2

Remarks:— Besides the articles mentioned in the above list, they had provided a portable surgical bag, a hypodermic syringe, a set of chatelaine, tape measure, tourniquet, roller bandages, first-aid package, cotton gauze, 0.2% watery solution of strychnine hydrochloride, 1% liquor morphinae hydrochloridi, etc.

Staff of the Dressing Stations :—The staff of the dressing stations naturally consists, besides the surgeons and sick berth attendants, of writers, stewards, civil employés etc. on board the ship. In a ship having a band on board, the bandsmen are mostly told off to serve as ambulance men while some of them are ordered to assist at the dressing stations. The writers are chiefly employed in recording the post, rank, and names of the wounded persons, the regions in which they were wounded, the time at which they are received at the stations and other things. Other members are employed in miscellaneous business. By the way of illustration, we shall give below the routine of duties fixed for the members of the dressing station on board the *Idzumo*.

The staff of the dressing stations on the *Idzumo* shall, at the command of “prepare for action”, be ready for work in the order stated below :—

1. The regular sick berth staff, their assistants and the conveyers of the wounded shall be ready in their respective dressing stations, and the ambulance men shall place themselves at the posts assigned (afterwards half the member of the ambulance men were ordered to stay in the dressing stations).

2. The chief writer and writers shall provide the dressing stations with blankets for patients—40 for each dressing station, and at the same time make preparations for the drawing up of a register of names and various reports.

3. The senior member of the band shall engage in the nursing of the

wounded and in arranging furniture, etc., in the stations.

4. The domestics shall get ready two wash-tubs filled with water, and also fill the jugs with drinking water.

5. *a)* The regular members of the dressing stations shall see to the proper arrangement of the operation table, dressing material, blankets, patients' clothes, mattresses, etc.

b) In the ammunition passage bandage and dressing boxes shall be stowed in their proper place.

6. The sick berth stewards and attendants shall be responsible for the orderly arrangement of disinfectants and surgical instruments.

2. Management of the Wounded in the Dressing Stations.

The treatment of the wounded in the dressing stations naturally varied as far as care and attention went, according the progress and phase of the battle and the number of casualties sustained. In almost every case the surgeons had usually to remain content during the actual engagement with giving the wounded urgent and temporary relief. When the wounded were brought in large numbers at any one time, those seriously wounded were, as a matter of course, the first objects of attention. The wound to be examined was laid bare by cutting off the clothes at the part, and any fragments of shell or other foreign bodies found in it were removed, provided always it could be done easily. No attempt was made at a deeper exploration into the wound, the treatment stopping short with wiping the skin about the wound with wet cloth dipped in 3% carbolic acid solution. Plenty of sterilized gauze was then applied over the surface of the wound followed by a bandage. In most cases, haemorrhage was left to stop on its own accord in this way, the ligation of an artery being restricted to unavoidable cases. When, however, a case was brought in attended with a serious bleeding at a time when the staff was pressed by reason of the number of wounded, the part right above the wound would be bound with a rubber band in such a way as to give temporary relief. In a case attended by a fracture, a splint was applied to the injured part before the person was removed to the temporary hospital. Those who had been given temporary relief

on the spot of injury by the ambulance men were of course examined at the dressing stations and had their dressings changed there. Only when prevented from receiving such attention on account of the large number of wounded were the slightly injured left unrelieved. It need scarcely be said that they were placed in the receiving quarters under the care of the sick berth stewards and the sick berth attendants where the surgeons also visited them from time to time to examine the condition of the breath, the pulse, the existence of shock or bleeding, and the amount of pain that a patient might feel.

As a rule, they set about the proper treatment of the wounded as soon as a battle was over. On this occasion, the severed ends of the arteries were sought out and tied, or twisted so as to secure the arrest of hæmorrhage; foreign bodies, if found still remaining in the wound, were removed, the process being followed by the cleansing of the surface.

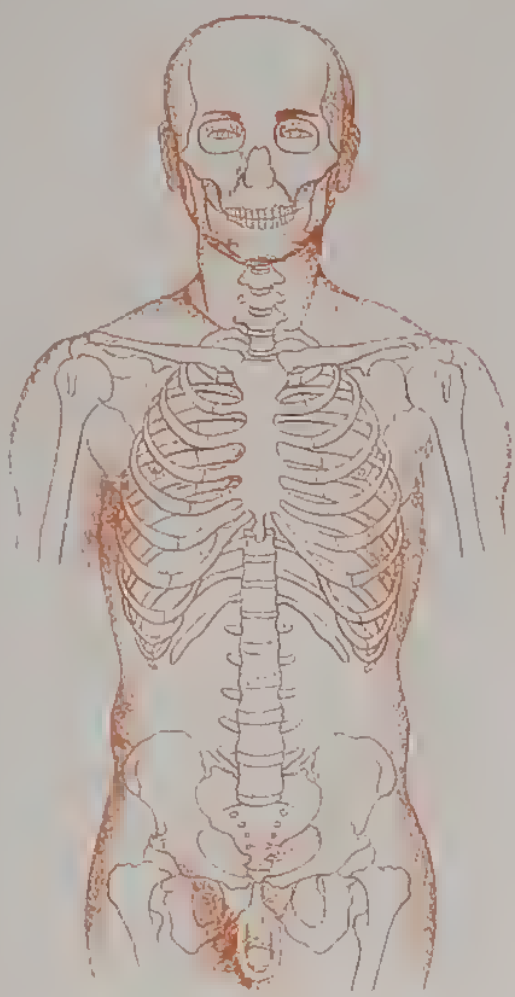
With lacerated and mutilated wounds of a limb with roughly torn and contused edges, an operation was necessary. The hair about the wound was shaved off, the skin wiped clean, and other precautional steps taken chiefly with a view to an aseptic method of treatment, other minute and time-taking operations being put off for some other available day. The surgical operations above mentioned were usually performed in the operating room or in the ordinary surgeries and it was only in case such rooms had been made too dirty by the smoke, soot, and dust raised during the battle, or when it was found difficult to convey the wounded at night through the places where the seamen were sleeping, or when the ordinary surgeries had been destroyed during the fight,—it was only in such case that the dressing stations were made use of again, though of course even then not until the rooms had been sprinkled with a disinfecting solution and wiped as clean as possible.

In every ship except the *Mikasa*, the operating room or dressing room to be employed after the conclusion of a battle was one of the ship's apartments with some simple re-construction for the purpose. As this apartment was generally situated on the main deck, it was in some ships destroyed by hostile shells during the battles. On the *Yakumo*, the officers' sick bay was allotted for the purpose. The room lay on the port side in the 4th compartment of the main

CASE PAPER—DIAGRAMMATIC FIGURES.

$\frac{1}{2}$ scale of the original.

No. 1. a.



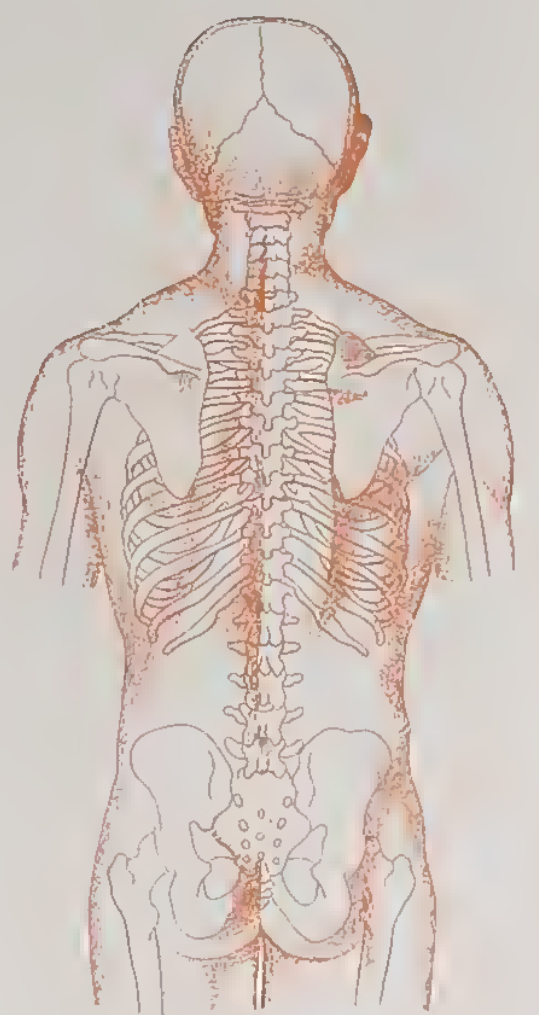
No. 1. b.



No. 2. a.



No. 2. b.



No. 3. b.



No. 3. a.



No. 4. b.



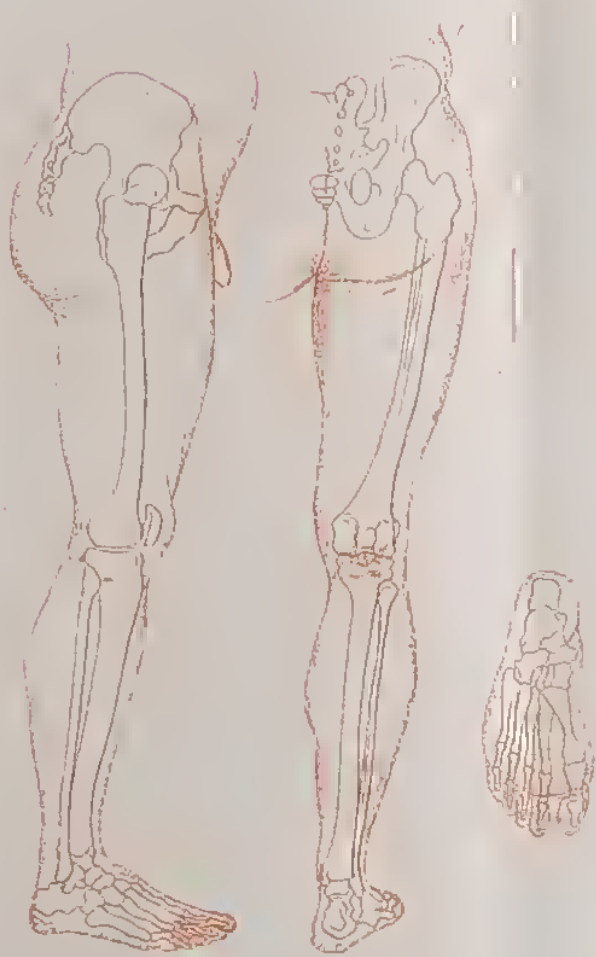
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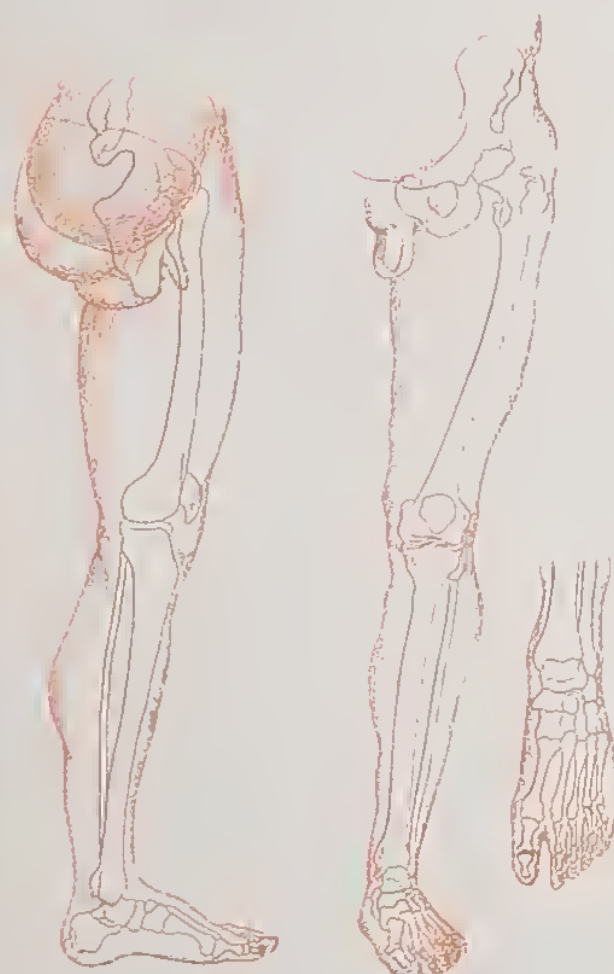
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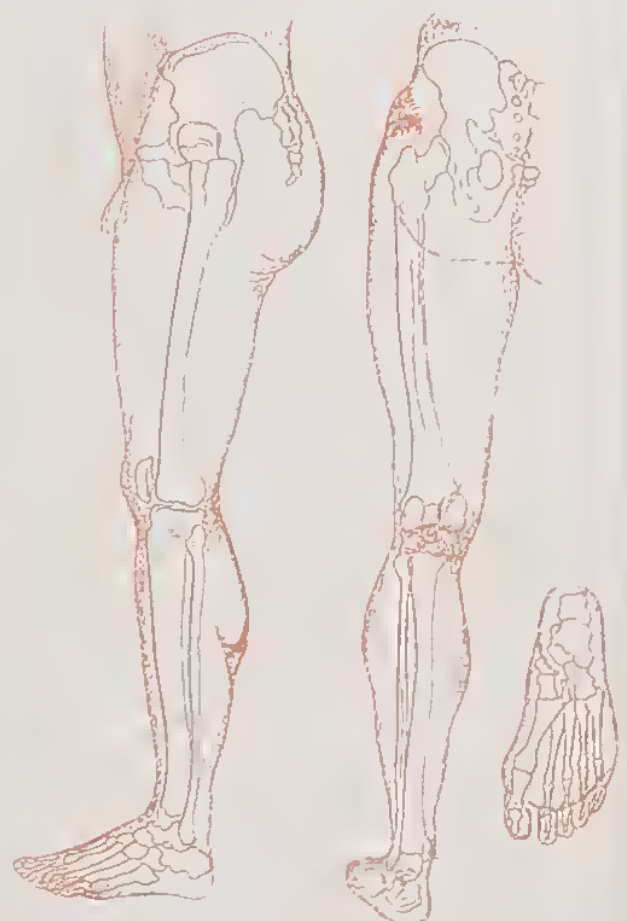
No. 5. a.



No. 6. b.



No. 6. a.





deck (the quarter least susceptible to movement as it lies almost in the middle part of the ship). In preparing for actual service, all the furniture and one bedstead in the room had been taken away, only the bedstead situated against the side of the ship kept *in situ*. This bedstead was covered with a suitable wooden-top and was used as a dressing table and for instruments and materials. In the middle of the room, there was placed a folding operating table made of metal. The operating room of the *Mikasa*, was a very complete one. It was located on the main deck, but was destroyed during the battle of the Japan Sea by a hostile shell.

After receiving the wounded in the above mentioned order, the wounded persons were taken—officers, to their cabins or sick bays, and petty officers, men and civil employés, who were seriously injured to the crew's sick bay. There the strictest attention was given them and they were given all the comforts that the ship's accommodation could allow, pending the arrival of a hospital ship, or of an opportunity of sending them back to naval hospitals at home. It will thus be seen that it was a very exceptional matter for a great surgical operation to be performed on board a ship during the war.

3. The Line taken in the Treatment of Wounds.

The first treatment of the wounds of injured persons during the Japan-China war of 1894-1895 was uniformly done under antiseptic methods. The surface of a wound, therefore, was washed with an antiseptic lotion, such as carbolic acid solution; a wound communicating with a cavity was treated with some such solution as boric acid, and iodoform was applied to almost every kind of wound in powder. In spite of all these precautions, the result was that scarcely any kinds of wounds except small ones escaped suppuration. At the outbreak of the late war, which was fought just ten years after the Japan-China war, we expected that in view of the progress made in surgical art during that period, we should be able to turn over a new leaf in the treatment of wounds. Indeed, we made it our principal aim to deal with wounds on aseptic methods and to refrain as much as possible from needless interference with wounds. The wounds, however,

that are inflicted at a naval battle are not only serious and complex, but, according to the conditions of the combat, there may occur cases which it is advisable to regard from the very beginning as infected wounds, and in consequence it is not always prudent to treat them by absolutely aseptic methods to the exclusion of all others. There were, in fact, many instances in which a compromise of both methods had to be employed. Thus the measures actually adopted by the surgeons could not be uniform: they all differed more or less from one another. In cases in which wounds had to be treated speedily, the surface were sometimes sprinkled with such medicine as an antiseptic powder, such as the compound of boracic acid and salicylic acid highly recommended by the American Surgeon, Nicholas Senn.

We give below the substance of reports on the methods of dressing wounds practised on board those ships which had a comparatively a large number of casualties:—

The First Attack on Port Arthur.

The *Hatsuse*:—The following regulations had been issued with a view to ensuring an absolutely aseptic method in the treatment of the wounded.

1. Dressing materials shall be kept in definite cans and be sterilized before being used.
2. Surgical instruments employed shall be such as have been sterilized with a hot solution of bicarbonate of sodium.
3. In the dressing stations there shall be provided an instrument sterilizer for the purpose of sterilizing such few necessary instruments as forceps, artery forceps, needles, probes, etc.
4. The surgeons and assistants shall have their hands carefully cleansed with corrosive sublimate solution.
5. When needed, the surface of a wound shall be wiped with sterilized gauze.
6. Disinfection of the surface or margin of a wound with an antiseptic solution shall be avoided.

In addition to the above regulations the supplementary members of the dressing station had each his special piece of work assigned to him—some to

place the wounded on the operating table, some to take their clothes off, others to carry off the treated persons off and lay them down easy and comfortable positions, and so forth. A sick berth attendant was told off to superintend them, while the surgeons and all other members of the sick berth staff devoted themselves to the actual treatment of the wounded.

(Fleet Surgeon B. Seki, Chief Surgeon to the ship.)

The *Shikishima* :—All the persons wounded received their injuries at one time from the explosion of a hostile shell, and they were all crowded together at the same time in the fore dressing station where their wounds were laid open (each battery had a certain number of first-aid packages provided, and every officer a first-aid package). Here they had their wounds dressed one after another in the order of severity of injuries, and treatment here was divided into first and secondary stages.

In the first stage of treatment, those seriously injured whose wounds were or attended with haemorrhage had their uniforms taken off and replaced by a hospital dress. Then the wounds were laid bare, the staff, strictly observing the order "Never to touch a wound but to dress it immediately," applied to the wounds sterilized gauze followed by a bandage. The patients were, then, taken to the temporary hospital and kept quiet.

The second stage of treatment was commenced after all the wounded persons had gone through the first stage, and in this stage those bandages were found tainted by haemorrhage and those who were recognized to be seriously injured were first dealt with. In performing the first stage treatment, the members of the fore and aft dressing stations had acted independently, but when the signal to "Stop firing" was given at 0.30 p.m., and we found that there was no more fear of any further casualties, all the members of the aft dressing station were summoned to the fore station and the whole staff of both stations set about the second stage treatment in co-operation.

The minute examination of the patients began about 3 p.m. Whenever we found a case attended with haemorrhage, it was arrested by tying the artery without putting a finger or a probe, etc., into the wounds; sutures were laid whenever this process was found suitable; the part deprived of the soft tissue-

was stuffed with sterilized gauze; the margin of a wound stained with coagulating blood was wiped clean with gauze moistened with sterilized water, followed by a bandage.

(Fleet Surgeon T. Ikeda, Chief Surgeon to the ship.)

The *Asahi*:—1. Seeing that a wound sustained while the body is dirty is naturally apt to have its inside soiled, thereby greatly affecting the chances of healing, we made it a rule to arrange for the crew to take baths on the day previous to an expected battle. This was done not merely for the reason above mentioned, but also because of the rest and refreshment thus given to mind and body, which would greatly contribute towards enabling the men to meet the stern hardships of the battle with renewed spirits and vigour.

2. The greatest obstacle in the way of aseptic methods on board a ship is the dust which is flying about everywhere. With a view to minimizing this nuisance as far as possible, the dressing stations, when first fitted up, were thoroughly cleaned and the walls wiped clean with carbolic acid solution. The deck was also sprinkled with the same solution out of a watering-can.

At the signal, "Clear for action," the surgical instruments were sterilized and were then left immersed in a 3% carbolic acid solution and covered with a cloth; the exterior of the bandage and dressing box was likewise wiped clean with the same solution and also left covered with a cloth till required.

3. As regards sterilized water, we prepared it, as a rule, the day previous to a battle in order to have it as fresh as possible, and it was used for cleaning the surface of wounds, and for the medical corps to wash their hands.

In sterilizing their hands and arms, the medical corps first washed the forearm below with soap. Then they cleaned out their nails, which were afterwards brushed carefully with 10% soap spirits in imitation of the Mikulicz's solution, then washed with sterilized water, and then again dipped in a 0.1% sublimate solution or 3% carbolic solution. Finally, they were rubbed and wiped clean with a cloth moistened with the same solution.

As mentioned above, owing to the lack of perfect appliances, we were unable to obtain a pure and genuine sterilized water. Hence, in cleansing the surface

of wounds we made the most sparing use of such water, its place being taken by dry gauze.

4. The wounded persons had their clothes first taken off or cut off; then the surface of the wound was speedily covered with sterilized gauze; the skin around the wound was shaved (with additional purpose of thus rubbing off the dirt on the epidermis); the part was then brushed clean with soap spirits and was repeatedly rubbed and wiped with cloth dipped in carbolic acid solution. Next, the part beyond the disinfected wound was covered with a sterilized cloth, the gauze on the wound was taken off, and the surface of the wound wiped clean with sterilized dry gauze, or gauze dipped in sterilized water and lightly squeezed. If a foreign body—a shell-fragment, a bullet, or the like—was found penetrating in the wound, it was at once extracted, special heed being taken at the time as to the existence within the wound of a torn fragments of clothes. Anything like a bullet lodging under the skin was removed by means of counter openings; with a deep wound, a suture was avoided in order to give free escape to wound secretions. The process was, however, never omitted with shallow wounds, in which there was no danger of secretions accumulating within. As a rule, wounds were treated with an aseptic dressing, but in the case of wounds in the face, nose, lips, or the like, in which the dressings would unavoidably soiled by secretions or food and drink, its place was taken by iodoform gauze.

(Fleet Surgeon S. Ishihara, Chief Surgeon to the ship.)

The Naval Engagement of the Yellow Sea.

The *Kasuga*:—Our dressing stations, like those on board other ships, were provided with a tank of sterilized water, a steam sterilizer for dressing materials, a sterilizer for the surgical instruments, an operating table, operation gowns, wash basins, etc., and thus with most cases of wounds we found it unnecessary to use an antiseptic solution. However, we made use of 2% carbolic acid solution; but only in such complicated cases as mutilated wounds in which there was a reason to fear the lodgment of some foreign body, or that the wound had become more or less soiled in the course of conveyance. The solution was also employed in disinfecting the skin about the wounds.

(Staff Surgeon Y. Tachibana, Chief Surgeon on board the ship.)

The *Nisshin* :—On the arrival of a wounded person at the dressing stations, we paid special attention to his general symptoms, and if the wound was found to have an extensive area, we first managed to restrain the hæmorrhage with tourniquet or direct compresses, and then wiped the borders of the wound with a cloth moistened with carbolic solution, followed by a compress of gauze and absorbent cotton wool (all having been previously sterilized) and put on a bandage. Then the patient was transferred to the receiving room. Thus far belonged to the treatment of the first stage. After this, we visited the patient from time to time, and strict attention was paid to the amount of the blood-stains on the bandages, and to his general symptoms. For the treatment of the second stage, we first removed the bandage, washed the skin around the wound carefully with soap, shaved off the hair around the wound and thoroughly cleansed the part with carbolic acid solution or alcohol. Then any severed ends of blood-vessels, large or small, were tied or twisted so as to arrest hæmorrhage, and the surface of the wound was lightly washed with 2% carbolic acid solution, this latter being however omitted in cases attended with copious bleeding. The dressing of the wound was then performed with plenty of gauze and cotton according to the customary method. Abrased wounds or blind wounds with a narrow surface were sprinkled with acids boracic and salicylic mixed. The treatment of the second stage commenced at 9 p.m. on the day of the battle and was finished at 1.30 the next morning. For the purposes of this treatment, we found our dressing stations to be very inconvenient, and it would have been equally inconvenient and highly inadvisable to do the work in the sick bay. It was already midnight and we should have had to make our way through narrow passages where a large number of seamen were lying asleep and should also have had to pass through a hatch leading to the main deck, to say nothing of other inconveniences. So we were obliged to content ourselves with the divisional officers' cabin. It is true that as we had already two wounded officers here, the situation was convenient for treating them at once. Besides, the room being situated within easy reach of the temporary hospital, it had this advantage that the patients could be taken there without difficulty. Still the imperfect arrangement of the room and its restricted space gave us a good deal of inconvenience.

(Staff Surgeon Y. Sudzuki, Chief Surgeon on board the ship.)

The Naval Battle of Ulsan.

The *Idzumo* :—It is manifest that in giving relief to the wounded during a naval fight either on the spot of injury or at the dressing stations at the time of redressing, we cannot rely on an aseptic method merely. This is not only true for the treatment mentioned above it may even hold good for the third stage of dressing wounds after the battle is over. It is true that the progress of modern surgery in recent years demands that we should not apply any stimulating medicine to the surface of a wound, and in the case of a bullet wound of small calibre, it is better to give it an indifferent method of treatment, (if we may use the term). Still, we do not hesitate to affirm that with the wounds sustained in a naval fight there is often much that prevents us from following this ideal. Therefore, in our ship *Idzumo*, we did not simply rely on aseptic methods: we had also an antiseptic treatment. We laid it down as a general rule to make the least possible use of strong corrosive medicine, and to use carbolic acid in solutions of 1-2% (according to the nature of impurities of the wound),—cotton balls soaked with the same and also boracic acid solution. We did not use sterilized water: it proved to be a very laborious task to prepare it, and it was liable to become tainted as the hours went on.

(Staff Surgeon K. Mochizuki, Chief Surgeon to the ship.)

The *Tokiva* :—We followed an aseptic method in dressing wounds: such dressing materials as gauze, cotton wool, cotton cloth for bandages, lint, everything to be applied to the surface of wounds, operating gowns, etc., were all put into cotton cloth bags as previously arranged, and subjected to steam-disinfection. They were then kept in closed air-tight cans, and only taken out in small quantities as needed at the time of treatment. The surgical instruments were also boiled and sterilized in a sterilizer containing a watery solution of sodium carbonate; the cleaning of the surface of a wound was done by means of sterilized gauze. The surgeons and assistants brushed their hands and fingers with soap, washed them in sterilized water, and, finally, after dipping them in a 0.1 % corrosive sublimate solution, wiped them clean.

(Fleet Surgeon Y. Sudzuki, Chief Surgeon of the Ship.)

The Naval Battle of the Japan Sea.

The *Asahi*:—1. The dressing stations were cleaned as well as possible; the surgical instruments after being sterilized by boiling were left lying in 2 % carbolic acid solution and covered with a cloth so as to protect them from dust. The instrument-sterilizer was kept lighted so as to have it ready for further disinfections of surgical instruments already used. Dressing materials were subjected afresh to steam-disinfection on the day of the battle and preserved in tin-cans. Those members of the dressing station staff whose tasks might possibly involve the touching of wounds of injured persons were ordered never to omit the washing of their hands and fingers, and for all miscellaneous purposes in the dressing station sterilized water was employed.

2. Wounds were speedily covered with sterilized gauze, and an extensive cleaning of their margins was performed according to the established method (by using antiseptic solution). To wounds recognized as clean, we applied an aseptic dressings, with wounds which were found to be soiled with impurities, we wiped the interior clean with a piece of gauze or cloth dipped in a carbolic acid solution. With those wounds in which we found lodgments of hair or any torn pieces of clothing, special care was taken to have them thoroughly cleaned out. To the surfaces of wounds we always applied sterilized gauze.

3. As regards surgical work during the actual engagement, we dealt with the wounds simply with a view to checking hæmorrhage, preventing the intrusion of dirt, and giving temporary relief. It was not until the firing had ceased that we undertook careful examination of the wounds, extracting foreign substances or free bone fragments. A shell-fragment, if found lodging under the skin, was taken out by means of an incision. To those wounds which were not deep and which had margins comparatively regular, we applied sutures, which mostly resulted in accomplishing union by the first intention.

(Fleet Surgeon H. Usui, Chief Surgeon to the ship.)

The *Idzumo*:—On the day of the battle, the dressing stations were swept clean in the morning, the operating table was set, the surgical articles and necessary utensils were arranged in order. The surgical instruments were disinfected by boiling, and dressing materials and operation gown, etc., were placed in a

steam-sterilizer ready for that purpose. No sooner had the firing begun than we put on our operation gowns, trimmed our finger-nails, gave a preparatory disinfection to our forearms and parts below, and thus waited for the arrival of the wounded. When they came, we disinfected our hands and fingers again, while the assistants were busy in cutting off the clothes of the wounded. When laid bare, the wound was quickly covered over and pressed down with sterilized gauze; the skin around the wound was shaved and the part was then carefully rubbed and wiped with a cloth moistened with alcohol (soap ablutions were refrained from, out of fear lest the dirty fluid should flow into the wound). Arteries requiring ligation, if any, were tied with silk threads, and oozing of blood was wiped away only with sterilized gauze. It was never washed away nor ever sprinkled with an antiseptic solution or powder. To say nothing of useless probing of the wounds, even the direct touch of its surface with the fingers was shunned as much as possible. Nothing but a thick compress of sterilized gauze was applied to the wound, which was then covered with sterilized absorbent cotton and paraffin paper, followed by a bandage. But when several men of No. 5 gun-crew were injured at one and the same time, we had not enough time to shave the skin about the wounds, and the treatment was put off until night time when the redressing was first performed.

Persons who were wounded seriously had their dressings renewed on the very night of injury, and once a day on the 28th and 29th following, and were sent home to hospital on the 30th. Of course, we changed the dressings oftener when necessary, as, for instance, in certain cases which were attended with profuse bleeding so as to make us apprehensive of the existence of a secondary haemorrhage. In one case of a simple fracture of the femur, the injured limb being extended, a flexible wooden splint was applied to it by way of temporary relief, and on the following day under the influence of chloroform, the ends of the fractured bone were reduced, which was followed by the application of Liston's leg and thigh splint to the limb. As regards abraded wounds, we applied a bandage to them only once at the beginning, and this was left as it was till the formation of a crust. Most of these cases healed over by first intention without suppurating. We had one case (that of a hired servant named Hoshino)

which was not sent to the Sasebo Naval Hospital, because it looked as if the wound would heal by first intention. For some reason or other the wound suppurated and the progress was much retarded. He was transferred on June 6 to the *Kobe Maru* at Chin-hai Bay.

(Surgeon Inspector Y. Saito, Chief Surgeon to the ship.)

The *Otowa*:—When a wounded person came into the dressing stations, his injuries were inspected in a general way; if necessary, he had his garment stripped or cut off and was placed on the temporary operating table, where the wound was examined as to locality, size, and severity, all the important points being recorded at the time by an assistant. For first treatment (that is, for relief given while the fight was actually going on), wounds were dealt with mainly with a view to temporary relief—this in order both to economise time and to prevent things falling into disorder and confusion. In cases accompanied by copious hæmorrhage, we did indeed do our utmost to arrest the bleeding, but as a rule, in dealing with wounds in this stage, we merely wiped the blood from their margins, sprinkled them with a mixture of boracic and salicylic acids, and followed this up by the application of sterilized dry gauze or cotton. All probing into the wound was absolutely shunned; only in cases in which torn pieces of clothing or some other foreign bodies were clearly recognizable as lodging in the wound superficially and easily taken out, was the extraction performed. All further processes were reserved for the second stage treatment, which was undertaken later on when we were far away from the enemy's ships.

Treatment of the Wounded after the Battle:— The circumstances of that day's battle were such that we were quite unable to foresee when the engagement would come to an end, or when the wounded persons could be sent home to hospital. We, therefore, thought it prudent to perform operations in the ship on the persons heavily wounded, and at the same time to give second stage treatment to those who were slightly injured. The operating table was soon made ready again, and following the aseptic method, we wiped the margins of the wounds with a weak antiseptic and soap. We had on board our ship no apparatus for preparing sterilized water, for though we had intended to provide ourselves with one, a sudden order to proceed to the front had obliged us to start without

having realized our intention. Then we cleaned the wound again with 50% diluted spirits followed by the application of sterilized gauze to the surface. Wherever there was a possibility of a wound being soiled through the existence in it of a torn fragment of clothing or of any other foreign body, it was cleansed with a cloth dipped in antiseptic solution and sprinkled with a mixture of boracic and salicylic acids. In a word, for ship-treatments we followed the antiseptic method as well as the absolute aseptic one, without simply relying upon the latter.

(Staff Surgeon S. Kusaka, Chief Surgeon to the ship.)

The *Akashi*:—The dressing materials and operating gown we used had already undergone a strict sterilization in a steam sterilizer, into the kettle of which we placed them in four big canvas bags. Every four *tan* of gauze was cut into pieces, each, 24 c.m. square, and every 20 roller bandages were placed beforehand in their respective bags. This had been done about two weeks before the battle, and we feared that the efficacy of the sterilization might already have been somewhat lessened. Still we were confident that no great change would have taken place, for the materials etc. had been kept in the bags with their necks tied up tight.

All the surgical instruments were disinfected by boiling in an instrument sterilizer, and then placed on an instrument tray filled with carbolic acid solution. Hands and fingers were disinfected by means of a nail-brush dipped in cold soapy water and then washed in a sublimate solution, this latter act being repeated often during the operation.

The floor all about the operating room was first wiped clean and then sprinkled with carbolic solution to prevent the rising of dust.

As regards the treatment of the wounds, we managed to check the hæmorrhage, to remove foreign bodies and to extract pieces of broken bone, if such existed, and then to wipe the wound clean with gauze moistened with sublimate solution, followed by the application of sterilized gauze and a bandage. There were some wounds, however, in which the nature of the surface led us to wash them with sublimate solution, while on the contrary there were other cases in which we covered the wounds at once with sterilized gauze, totally dispensing with the use

of an antiseptic.

As we had a large number of casualties on our ship at one time, we of the dressing station staff found ourselves extremely busy and it was quite out of the question for us to give the wounds anything like a satisfactory treatment on the first occasion. Accordingly, temporary first-aid measures were taken with the main object of checking the hæmorrhage and closing the surface of the wounds. We lost two severely wounded patients who died before we could give them the second treatment; but for the rest of the wounded we gave them, at the conclusion of the battle, a minute and careful examination and a cautious treatment, followed by the renewal of bandages. It need scarcely be mentioned that small wounds had already been completely dealt with at the time of the first treatment.

(Surgeon K. Fujinuma, Chief Surgeon to the ship.)

III.—A Summary of Treatment given on the Naval Hospital Ships and in Naval Hospitals.

At the outbreak of the Russo-Japanese war, the Navy Department equipped the steamers *Kobe Maru* and *Saikio Maru* as hospital ships, to receive the wounded and sick, and to convey them home. Each naval hospital, also, was enlarged as the war went on, with increased accommodation for a larger number of patients. This was especially the case with the Sasebo Naval Hospital which was at the base of operations for our combined fleets;—the ward pavilions of the hospital were enlarged, new ones being constructed at the same time for temporary use. Each of the hospital ships was as completely equipped for the treatment of the wounded and sick as a naval hospital; among other things, they had as perfect provision as could be desired for aseptic and surgical arrangements. During the first stage of war, these ships stayed at the temporary base of operations near Port Arthur or alternately transported the sick and wounded home to the hospitals. It was arranged that each ship should, as a rule, take home the sick and wounded as soon as it had a full number of patients on board, so that the duration of treatment on board these ships differed much for each patient. Consequently, the general lines of the treatment given to the patients on the hospital ships were very much the same as those in the naval hospitals: that is,

the wounded were treated according to a conservative method, although operations major or minor were performed when needed. Much to our regret, the hospital ships could not for certain reasons accompany the fleets in their various movements. They were not able to be present at some of the most important engagements, or to receive the wounded from the fighting ships immediately after the conclusion of a battle. This, however, is unavoidable in a naval engagement. Those who were wounded at the battle of the Yellow Sea fought on August 10th, 1904, were transferred to the Hospital Ship *Saikio Maru* on the 12th, and others who were wounded on land or sea from time to time were accommodated and treated in one of the hospital ships on the very day of injury or within three days after. The length of time that expired before the wounded were admitted into a naval hospital at home varied greatly according to circumstances; the wounded at the first attack on Port Arthur were admitted to the Sasebo Naval Hospital from the transport *Genkai Maru* within 96 hours after the time of injury; those wounded at the battle of the Yellow Sea on August 10th were transferred to the same hospital from the *Saikio Maru* on the 14th following; those injured at the engagement off Ulsan were received at the same hospital from the fighting ships themselves within 36 hours after injury; the wounded on board the torpedo boat flotilla at the battle of the Japan Sea on the 27th and 28th of May, 1905, were admitted into the Takeshiki Sick Quarters within 15 hours after injury, and those on the main fleet into the Sasebo and Maizuru Naval Hospitals within 72 hours. In most other cases, occurring from time to time, the wounded were sent by the hospital ships to the Naval Hospitals at Sasebo, Kure, Yokosuka, and Maizuru in from 5 to 10 days after injury.

We now reproduce the report sent in by Surgeon-General K. Totsuka, Director of the Sasebo Naval Hospital, on the conditions of the wounded persons admitted into it.

First Report made by Surgeon-General K. Totsuka,
Director of the Sasebo Naval Hospital.

It need not be said that the conditions of the wounded persons, when admitted into the hospital differed according to the length of time that had elapsed between the time of admittance and that of injury, as well as to the

manner of treatment given them previously, and many other circumstances. With the wounded persons first received at the hospital, four days had already elapsed after injury; with those received next (that is, those wounded at the first blocking expedition of Port Arthur) over five days had passed, and with the third batch (that is, those injured on board destroyers on March 10th), full three days had elapsed before they were admitted into the hospital.

By way of a general summary of the condition of their wounds without reference to this difference of time elapsed, we may state that the wounded persons mentioned above were found, when admitted to the hospital, to have all their wounds inflamed in a somewhat advanced stage: the hæmorrhage had been arrested, and the bruised tissues were already sloughing off, and a reactionary inflammation was already developing around the lips of the wounds. The larger and still open wounds were in most instances covered with a dark grey slough, and no signs of firm and red granulations were yet to be seen. With wounds to which the primary suture had been given, a partial coaptation was found in a few cases, but most of them had stitch-abscesses, each surrounded by a red swollen halo. Among the contused and penetrating wounds, there were some cases in which the wounds were filled with coagulated blood, and without developing any sign of inflammation, and which showed every sign of healing by first intention. In most of very large wounds, the dressing materials were found soaked through with a copious dark-red wound secretion, some of which emitted an extremely offensive smell and others had advanced so far as to present evident signs of suppuration. Indeed, in examining the wounds we found shell-fragments and other easily seen foreign bodies already extracted, but it frequently happened, for several days after the wounded had been received, that we had to take out from their wounds foreign objects hitherto unextracted, such as torn pieces of clothing or small fragments of bones. With the exception of a very few persons seriously injured, the wounded were found to be in a very favourable state as regards their general condition; they were in very lively spirits and showed no sign of distress or depression; indeed, if we except those whose injuries were accompanied by a bone fracture, none seemed to have felt any serious pain. As regards the body temperature, it showed an elevation of 38° — 39.5° C. in those who were seriously in-

jured at the time of admission to the hospital, but it never rose higher than 38° for most of the wounded. Their appetites were almost normal, and they mostly preferred the ordinary full ration to the regulated diet for the patients.

Now briefly to state the method of treatment given in our hospital. On the arrival of the patient we first removed the bandage with strict aseptic precaution in order carefully to inspect the size and aspects of the wound, then we examined the wound with the help of a probe, if needed, but with caution. In cases where the tension of the suture was too great, we removed the threads. To wounds requiring an amputation or some other complicated operation, proper treatment was given on the operating table; the wounds having a clean surface and margins were wiped with a cloth moistened with sterilized water, followed by the application of disinfected gauze and a fixing bandage. Wounds presenting signs of suppuration or discharging a putrid secretion, or attended by a fracture, we washed, as a rule, with 0.3 % corrosive sublimate solution, and applied iodoform gauze or sprinkled them over with acids boric and salicylic, followed by a bandage. We made it our usual course in dealing with wounds to make a minute search for shell-fragments, foreign bodies, fractures, etc., after the first change of the bandage and never before. In doing this, we relied on X-rays and other accurate method of diagnosis, and then treated the cases in a suitable way. Most of the small blind wounds and perforated wounds, in which the diameter of the wound track was not bigger than that of a bullet, closed within two or three weeks and healed by primary intention. Even a wound with the size of a man's palm or larger, attended with loss of soft tissues, unless accompanied by an injury to a bone, developed the separation of the sloughing tissues, followed by the growth of a healthy granulation, without presenting any extensive inflammatory infiltration or a phlegmasia affection. There were only two or three cases in which the long continuance of a copious discharge of pus retarded the development of the healing process, owing to the unrecognized existence in the wounds of such foreign bodies as fragments of clothes, bone, etc. Those patients whose injuries were attended with a fracture, and for whom the conservative treatment was employed, all took a favourable course excepting one (a man named M. Torii) who is down with a compound fracture of the head of the left femur.

There were four cases which terminated in death in the interval from the time they were admitted to the hospital down to the end of March. We shall now give a brief sketch of the course they took and the causes of their deaths:—

(No. 1.) M. Ono, Signal Boatswain :—When first admitted to the hospital, his left lower limb below the knee-joint presented a darkish purple hue showing that it was already in a gangrenous state, and as to the right limb, the skin was cold, and the sensation almost paralysed. Symptoms of collapse having already set in, it was nearly hopeless to operate on him with safety, so we determined to delay amputation, and to administer roborants and stimulants until the patient should be in a more favourable condition. But all was in vain: the man succumbed to the wound on the following morning. The cause of death seems to have been the heavy loss of blood consequent on the injury of the popliteal artery, and the obstruction of circulation in the left lower limb.

(No. 2.) T. Sakamoto, Petty Officer 2nd Class :—When he was received to the hospital, his left leg had already been amputated at the point two inches below the knee-joint and in his right foot, the part anterior to, and inclusive of, the head of the first metatarsal bone was mutilated and torn off. Also there was a large contused and lacerated wound about the size of two palms on the back side of the left thigh, besides numerous small lacerated wounds and large burns on the face and neck. At the time of the admission the temperature was very high; the surfaces of the wounds were covered with necrotic tissues and the discharges were copious, foul and stinking. The septic infection was manifest, and at the end of six days he died of exhaustion.

(No. 3.) T. Okada, Signalman :—He had a blind wound, in the neck, with entrance in the right submaxillary triangle, near the front median line. The entrance aperture was irregular and of the size of the little finger. His symptoms—the fact that he had hæmoptysis, though not profuse, that he complained of dysphagia, that his breath smelt fetid, and the intense pain and stiffness of the neck—spoke eloquently for the supposed seat of the fragment, that it must have penetrated the larynx and oesophagus and be lodging somewhere about the spine. The entrance aperture being found already closed, we had no alternative but to search the oral cavity, but were never able to discover it. Not only did

the above symptoms abate as the days went on, but from about February 24th signs of paralysis came on over the left upper and lower limbs, and the patient at last died on the 29th. On a *post mortem* examination of the locality, it was found that the shell-fragment, passing by the right side of the epiglottis, had perforated the 3rd cervical vertebra and penetrated into the left lateral half of the spinal cord. Such being the case, we conclude his recovery was from the beginning hopeless.

(No. 4.) M. Torii, Ordinary Seaman :—The man had, in the right upper arm, a large gunshot wound accompanied by loss of soft tissues, and another similar wound in the upper part of the left thigh attended by the fracture of the head of the femur. It was a serious question whether the amputation of the thigh should take place at once or not; we concluded, however, to treat the wounds conservatively, only extracting shell-fragments and entirely detached pieces of bone still remaining in the wound. All our efforts, however, were of no avail, and the patient died of exhaustion on the 20th of the month.

The foregoing statement is no more than a brief summary of the courses taken by some thirty or more of the wounded cases: it cannot be made into evidence upon which to base any inference as to the course of gunshot wounds in general. Nevertheless, the results of the treatment given at our hospital compared with those hitherto attained elsewhere cannot be considered to be unfavourable. For example, most of the small contused wounds, penetrating wounds and the like healed by primary intention; and as regards lacerated and mutilated wounds and those attended with an extensive loss of soft tissues, although in some cases more or less suppuration was unavoidable, yet there was a very remarkable absence in almost all of them of severe inflammation, and not a single case of the subsequent development of any traumatic infective complication. Such being the case, the temperature and other symptoms of the patients returned to a normal condition very soon after their admission to the hospital, and the healing processes progressed with comparative rapidity. These are facts showing that the patients were free from serious complications of any kind. The favourable results thus attained in the hospital must be attributed to the fact that the recent advances in surgical science enabled the medical corps on board the ships, in spite of

necessarily imperfect equipments, to deal with the wounds in a satisfactory manner, even while a battle was going on, and all honour is due to every surgeon in the warships, hospital ships, transports, etc., for their thorough carefulness in treating the wounds in the primary period. It may also be a matter of course but certainly not one to be overlooked that the courses of the wounds of patients admitted to hospital from the hospital ships in the second and third batches were even better than those of men brought in with the first batch. For these cases may be looked upon as an object lesson showing us that a hospital ship, satisfactorily fitted up with medical accommodation, may be of the greatest benefit to patients, and it is, accordingly, our sincere desire that hospital ships may be employed hereafter as much as possible in the treatment and transportation of the wounded.

Second Report by Dr. K. Totsuka, Director of
the Sasebo Naval Hospital.

The Number of the Wounded Persons received:—The total number of wounded men received at the Sasebo Naval Hospital, from February 9th, 1904, after the first naval engagement outside the entrance to Port Arthur, to the last day of December of the same year, was 549, of whom 348 were our own naval officers and men, 11 wounded soldiers belonging to the Second Army, and 190 wounded prisoners, belonging to the Russian warship *Rurik* and the destroyer *Steregushchi*. Of the wounded above mentioned, 69 were still remaining in the hospital at the end of last year: the rest had either terminated their courses of treatment at the hospital or had been removed to other hospitals. As regards the results attained, 149 left the hospital completely cured, 7 improved, 3 invalided from the service, 13 died, and the remainder, numbering 309, were sent to other hospitals. It should be noted, however, that of the patients mentioned above, the 11 wounded soldiers of the Army, and 155 wounded prisoners were transferred to other hospitals after a short stay of only three days in our hospital, so that the number of wounded men actually treated at our hospital was 348 belonging to the Navy and 35 wounded prisoners, making 383 in all. Before giving further particulars as to the cases themselves, a few remarks on the accommodation and transportation of the patients will not be out of place.

On the outbreak of the Russo-Japanese war, our Navy at once equipped the steamers *Kobe Maru* and *Saikio Maru* as hospital ships, chiefly with a view to the accommodation of the sick and wounded at the front. These men, as a rule, were first received on board one of these ships and sent back to one of the home naval ports, whichever happened to be the most convenient. The proximity of Sasebo to the seat of war and the fact that it was our chief naval base, made it much more convenient for us to take our patients here than elsewhere, and it is therefore, needless to say, that the Sasebo Naval Hospital received by far the largest proportion of the sick and wounded not only from the hospital ships, but also from other transports, and sometimes even directly from a squadron or a torpedo-boat flotilla. For instance, those wounded at the naval engagement outside the entrance to Port Arthur on February 9th, were sent back to our hospital by the transport *Genkai Maru*, and those injured at the battle of Ulsan on August 14th, and the wounded prisoners, etc., from the Russian warship *Rurik*, were admitted to our hospital directly from ships belonging to the Second Squadron.

Seeing that the number of days that elapse between the time of injury and that of admission to a hospital has an important bearing on the treatment and prognosis of the wounded, we here give a list of the number of days that had passed in the case of those who were placed under our charge before their admission into the hospital:—

Admitted into hospital within 2 days after receiving injury.....	216.
Admitted into hospital within from over 2 days to 4 days after receiving injury.....	132.
Admitted into hospital within from over 4 days to 7 days after receiving injury.....	37.
Admitted into hospital within from over 7 days to 14 days after receiving injury.....	53.
Admitted after over 2 weeks from receiving injury.....	111.

As before mentioned those who were injured at the two great battles fought outside the harbour of Port Arthur on February 9th and August 10th, and those wounded at the naval fight off Ulsan on August 14th, and the wounded prisoners from the Russian warship *Rurik*, were all brought to us within four days

after injury. In such cases, we might say that the duties devolving on our hospital were much the same as those of an Army Field Hospital. We had to receive and treat wounded persons almost fresh from the fighting line. It will also be readily understood that the frequency of the transference of patients from our hospital to others naturally depends very much upon the number of in-patients and the conveniences of transportation; but during the late war, the number of the sick and wounded in our Navy was so much smaller than we had expected, that the number of beds provided in our hospital for patients sent back from the front always proved to be more than adequate for our needs. Consequently, we were never under the necessity of transferring elsewhere even a single severely wounded person once admitted to the hospital. In view of an unavoidable bad effects of transportation on wounded or sick persons, we made it our principle to give treatment at our hospital to all cases of fracture or other important wounds through the greater part of their course, and for the same reason, we also made it our aim to send slight cases back to their respective stations as soon as they recovered without removing them to other hospitals half-way through their course. Hence, 549 cases represent the number of the wounded persons received at our hospital, and from these 11 Army soldiers and 155 wounded prisoners slightly injured should be deducted. Now the total number of days' sickness spent for the remaining cases 383 was 17,023, which shows an average of 44 days per case. To classify the number of days' sickness for the 144 patients who were transferred to other hospitals, 30 were transferred within two weeks, 30 within from two to four weeks and 84 after over four weeks.

The classification of the wounded according to the actions in which they received their injuries was mainly as follows:—27 wounded at the engagement outside the entrance to Port Arthur on February 9th; 16 at the first, second, and third blocking expedition; 7 on the destroyers at the battle fought outside the entrance to Port Arthur on March 10th; 9 at the time of the disaster to No. 48 torpedo boat on May 12th; 33 on the *Miyako* and the *Hatsuse* on the occasion of the disasters that befell them, the former on the 14th and the latter on the 15th May (4 wounded on the *Miyako* and 29 on the *Hatsuse*); 66 at the battle of the Yellow Sea on August 10th; 27 at the battle of Ulsan

on the 14th of the same month; and 76 belonging to the Naval Heavy Gun Brigade (landing parties), and covering the period from July 26th to the following December 18th. Besides these, there was a small number of cases of wounds and injuries received during reconnoitring movements, bombardments on fortresses, and attacks made by torpedo boats. Classifying the wounded according to their ranks, we get 5 senior officers, 19 junior officers, 6 midshipmen, 1 high civil official, 11 warrant officers, 63 petty officers, 236 seamen and 7 employés. The men from the Army admitted to our hospital were all such as had been wounded at the fights of Pu-lan-tien and its neighbourhood on May 6th-8th. Of the wounded prisoners, two men had been rescued from the hostile destroyer *Steregushchi* at the time of the destroyer engagement outside Port Arthur on March 10th, and the rest were the crew of the Russian warship *Rurik*, who were rescued by our Second Squadron at the naval engagement off Ulsan on August 14th.

The Causes and Varieties of Wounds sustained in the Battles:—It need not be said that injuries inflicted in naval actions are generally shell-wounds, for whether in a battle on sea or in an attack on a coast fortress, the chief weapon used is the gun. Such wounds are usually inflicted by fragments of shell, but they are also liable to be produced by all sorts of objects whenever a shell bursts on board a ship. For instance, all manner of splinters of furniture, instruments, etc., broken by a explosion will fly about in all directions and as so-called indirect projectiles cause just as much injury as do shell-fragments; an explosion of gunpowder near by will produce severe burns, and the vibration of the air caused by the firing of a heavy gun may often produce a rupture of the tympanic membrane or a shock in the labyrinth. Besides, in the heat of an eager fray, men will stumble against or collide with objects in their paths, and many other similar accidents may happen to cause injuries of various kinds. As these wounds are usually inflicted during the thick of a fight, the wounded persons themselves are not always able accurately to describe the cause of their wounds, and it is often impossible to know whether a contused or a blind wound was inflicted by a shell-fragment or an indirect shot. For, in external appearance, these wounds have no special characteristics of their own, and although there is one guide to discrimination in the nature of the foreign body that may

be found buried in the wound, yet such object having already been extracted in the case of most patients sent back to us, we were often left in utter darkness as to the cause of the injury. Again, among the wounded men of the Naval Brigade, many of the wounds were inflicted by shrapnel bullets, and there was one officer who had a wound in the neck which we recognized to be a perforation by a small calibre shell which had pierced without exploding. Another officer had a wound in his leg caused by contact with a hostile shell that had fallen on to the deck and, having already spent its momentum, was rotating there like a top. There was yet another officer who, while standing by the side of his gun, received an extensive contusion both on the side of his thoracic wall and on the inner side of his upper arm from a shell which grazed between the side of his chest and his hanging arm. This seems to have resembled the injury resulting from the so-called "wind of a ball": strange to say, the wound was comparatively slight and healed in due time. The present increasing use of mines of various kinds in naval warfare, would lead us to expect that, among the wounded persons at a sea fight, there should be some whose injuries came from such causes. The main object of the mines is, indeed, the destruction of hostile vessels, and not that of human lives, but the dreadful havoc which it also works among the latter is truly staggering. For example, among the wounded admitted to our hospital, those from torpedo boats Nos. 48 and 49 received from the *Kobe Maru* on May 19th, and those from the *Miyako* and *Hatsuse*, were every one of them cases of injuries caused by mines. As regards the immediate causes, there were indeed some who were directly injured by fragments and splinters from the mine explosion, but in most instances the violent shock sustained by the vessels at the moment of the disaster or accidents attending its sinking were the proximate causes of wounds. The varieties of wounds thus produced were chiefly contusions, contused wounds, sprains, simple fractures, etc. In the case of the *Hatsuse*, not a few were severely burned by the explosion of the magazine. There were also a few other vessels on which men were injured by mines, or other explosives. It is worthy of notice that in these kinds of injuries, a state of increased nervous irritability may exist for some time after the disaster: the persons injured in the *Hatsuse* still showed

signs of shock and fright, and jumped at the slightest sound for several days after the calamity.

We have already stated that the varieties of wounds were (1) contused and lacerated wounds inflicted by shell-fragments or wooden and iron splinters; (2) burns and explosion wounds caused by gunpowder, mines or other explosives; (3) injuries to the ear produced by the violent vibration of the air consequent on the discharge of a gun; (4) various kinds of wounds due to causes other than shells and mines, such as the excitement of the battle or shock, etc. These kinds of wounds, however, were, more frequently than not, attended by complications. For instance, a shell wound may be accompanied by a burn or an explosion wound, or in addition to the above, by the perforation of the membrana tympani and a contusion, etc., and in by far the greater number of cases of shell-wounds, the persons are found to have been injured by numerous or at least by more fragments than one at the time. Such being the case, it need scarcely be said that as regards the wounded admitted to our hospital, the number of wounds far exceeded that of the persons wounded. Nevertheless, if we classify the wounded according to their respective chief wounds, we obtain the following results, as shown in the accompanying classification table of the wounds:— (1) wounds in the head accompanying fractures, 12; (2) wounds in the face attended with fractures, 9; (3) wounds in the cervical region accompanied by an injury of the trachea or some other important organs, 5; (4) penetrating wounds of the chest, 6; (5) wounds in the vertebral column and the sacral region, with fractures, 5; (6) wounds in the scapular region, with fractures, 6; (7) wounds in the upper arm, with fractures, 11; (8) wounds at the elbow-joint with fractures, 2; (9) wounds in the forearm, with fractures, 8; (10) wounds in the hand, with fractures, 12; (11) wounds in the thigh, with fractures, 12; (12) wounds at the knee-joint, with fractures, 6; (13) wounds in the leg, with fractures, 24; (14) wounds in the foot, with fractures, 7; (15) simple fractures of the limbs and dislocations, 10; (16) injuries in the ear, 38; (17) injuries in the eye, 6; (18) burns or explosive wounds, 22; (19) wounds in the soft tissues, 182, of which 15 were wounds with loss of soft tissues, 17 perforating wounds, 62 blind wounds, 46 contused or lacerated wounds, 37 contused wounds

or sprain of joints, and 5 abraded wounds or abrasions. An asterisk (*) is appended in "Table of Patients" to those cases which had some complicated wound, that was perceived to have a grave influence on the prognosis, termination, etc. Before giving a detailed description of cases, let us express our views, based on recent personal experience, concerning the commonest shell-fragment wounds.

The Nature and Course of Shell-Fragment Wounds:—The commonest wounds inflicted by fragments of shells in naval battles are speaking generally, mutilated and lacerated wounds of a special character, though of course varying in size and depth. In the case of a spent fragment, or one which merely grazes the surface of the body, there results a superficial wound on the skin or subcutaneous tissues, while a fragment travelling at high speed and striking the skin more or less at right angles produce, in proportion to its momentum, a penetrating or perforating wound of some sort. And it is self-evident that the diversity of fragments in size and shape will naturally produce divers types of wounds. For example, a fragment, if it is thin and flat and simply grazes the surface, produces a wound like an incised one, or, if it enters deeply, a wound whose aperture of entrance resembles that of a lacerated or punctured one. A fragment of an irregular polygonal shape will inflict an irregular contused wound on the surface, or a penetrating wound with an irregular wound track. As the power of penetration of a projectile depends partially on its sectional density, a cubic or polygonal fragment will, it is needless to say, have a by far greater penetrating force than a thin plate. What may be called, however, the special characteristic of a shell-fragment wound is the dreadful destruction or contused laceration of the soft tissues which it causes. The skin, muscular tissue, etc., are often found extensively stripped off or lacerated open, or else the muscle and adipose tissue severely bruised or mutilated. Further, in a very big wound, when more or less of the soft tissues have been carried off by the fragment, the underlying muscles, tendons, or nerves, etc., may often be seen lying exposed in the hollow cavity thus left. In spite of all this, however, when compared with wounds made by the rifle bullet used in field battles at the present day, a shell-fragment has a far smaller power of penetration. This can easily be realized by examining the nature of a large number of shell-wounds. Such an examination will reveal a

remarkable paucity of perforating as compared with contused and blind wounds. It will also be found that even such thin bones as the skull, sternum, etc., are often strong enough as to arrest the penetration of a shell-fragment. Again, the penetrating wounds inflicted by shell-fragments are found in most cases to have a comparatively short blind-canal, and it is only in rare cases that we find the trunk of the body or one of the limbs shot through lengthwise by a fragment as is frequently the case in a bullet-wound. The fact that a shell-fragment has so weak a penetrative power induces us to think that it might not be unprofitable to investigate into the possible utility of adopting armour to protect the neck, chest and abdomen, etc., of combatants during the actual fight. In the case of a shell-fragment entering the body, the wound track, it is almost needless to say, is very irregular and badly mutilated, while that made by a bullet is smooth and conical, and what is more, the fragment which has a weak penetrative force, meeting with more or less resistance from the tissue, easily changes its course, or else the fragment will rotate of its own accord on its own axis and thus often bring about a deep-seated but widely extended injury quite out of proportion to the comparatively small aperture of its entrance. This is especially the case when it happens to strike tendon or some other tissue which has a strong resisting power. It is manifest that the penetrating power of a shell-fragment very largely depends on the one hand upon its size and shape, and on the other, very greatly upon the distance from the spot where it explodes. For instance, a fragment which is not larger than a wheat grain or a bean may sometimes produce a penetrating wound several centimetres deep or even deeper when it comes from a shell exploded at a very short distance; whilst, when it comes from a shell exploding at long distance, a fragment, even if it be of the size of a thumb-head, will inflict no heavier injury than merely breaking the skin.

It would be most interesting, in connexion with the question of the injuries inflicted on tissues by shell-fragments, to make a study of the effects which these fragments have on the bony structures.

It is hardly necessary to say that the nature of wounds caused by shell-fragments depends in the first place on the power of penetration and in the second on the character of the bony tissue at the injured part. As far as the

experience at our hospital goes, the fractures caused by a shell-fragment at the shaft of a long cylindrical bone, have generally been found to be oblique ones of a comparatively simple type, sometimes two or three bone fragments entirely detached being found at the seat where the shell-fragment has struck, or sometimes a fissure running more or less straight up and down being found at the broken extremities. It appears to be very rarely that a heavily comminuted fracture is found, that is to say, an injury at all resembling the so-called "explosion-wound of bone", such as is often witnessed in wounds produced by a bullet discharged at a near distance. In wounds of the spongy tissue, such as the extremities of cylindrical bones, the shell-fragment is mostly found imbedded in the substance of the bone, and it is comparatively rare for a fissure to be found leading towards the shaft or articular end of the bone, nor have we ever seen a case of a bone perforated at its articular end as often happens with a bullet-wound. Our long and varied experience has taught us that in the case of a shell-fragment simply grazing the surface of a bone or of a fragment possessing a comparatively weak power striking its surface, the resultant wound is often no more than the mere separation of a splinter or a fissure or depression of that part of the bone, without any complete fracture. The above examples will be enough clearly to illustrate that the destructive effect of a small shell-fragment on a bone is considerably less than that of a bullet shot at a near distance. But to enumerate a few more instances by way of illustration, shell-fragment wounds of the head, in a larger number of cases, are no more than contused wounds of the soft part; even in cases where the cranial bone is involved, the injury stops at the outer table, and it is only in extremely rare cases that it reaches the cranial cavity. Even such a flat and thin bone as the sternum, sometimes, proves strong enough to check the penetration of a sharp shell-fragment. At the same time it must be remembered that, inasmuch as there is no limitation to the size of the shell-fragments, shell-wounds are in consequence sometimes liable to be extremely painful and destructive. For instance, it is no rare occurrence in a naval battle that a considerable portion of a limb is smashed and scattered bone, soft tissues and all; or that all the limbs or a greater portion of the trunk are mutilated. Such terrible wounds, however, mostly terminate in instant

death and are not, therefore, matters of much surgical interest. We shall not discuss them in this place.

Courses and Prognosis of Shell-Wounds:—We all had much anxiety as to the prognosis and courses of shell-wounds, because of their inauspicious general characteristics, that is, the extensiveness of the surface, the irregularity and raggedness of the cavities, the serious destruction of tissue inside the wound, and the frequency of entrance of foreign bodies into the wound, and also because of the difficulty of satisfactorily treating the wounds without delay as in peace time, etc. But we found that the results of our practical experience during the late war were surprisingly favourable one, for even penetrating wounds of the skull and chest, etc., mostly took a favourable course; fractures of the femur, and penetrating wounds of the knee-joint generally resulted in cures by the conservative method of treatment, and the death-rate of the wounded was no higher than 2.4 %, and instances of traumatic infective disease we had none. We shall reserve detailed reports of individual cases treated in our hospital for discussion in another place, and content ourselves here with a summary of general aspects.

In most of the cases admitted to our hospital at this time, we found that injuries of a comparatively simple nature, such as small contused and lacerated wounds, blind or perforating wounds of the soft tissues, etc, very generally healed aseptically without any traces of suppuration. It is true that, in the above instances, the surfaces of wounds at first presented a good deal of swelling and inflammation attended with copious discharges of wound secretion, but, in most cases, this gradually abated and was followed by a favourable progress consequent on the application of simple aseptic methods of dressing; the surfaces of wounds which had at first been dirty and irregular developed a firm and red granulation after the separation of the mortified tissues, and the discharge from the wounds which had been of a dark-brown colour was replaced by a colourless discharge, which contained only a few migratory cells. When this stage was reached, the swelling in and around the wound was found to have entirely disappeared: in blind or perforating wounds, the tracks were mostly closed, leaving merely a superficial granulating surface. The closure of such granulating surface was effected by the application of sterilized gauze which was left to dry in such a way as to induce

the so-called "healing under a scab"; in cases where the surface of the wound was somewhat extensive, we were able to promote its healing by means of Thiersch's skin-grafting. Lacerated wounds or wounds with partially detached flaps, etc., of the head and other parts, which had already been sutured before admission mostly resulted in healing by primary intention; but in some instances, stitch abscesses developed or the removal of the stitches was found necessary in order to relieve the part of tension. This last fact causes us to suggest that wounds of this kind might better be treated with the open method, for, when once a firm and healthy granulation has been produced, it is easy to promote healing by the introduction of secondary sutures. As to the number of days' sickness of the wounded in our hospital, contused wounds or lacerated wounds were, as a rule, cured in from two to four weeks, whilst penetrating and perforating wounds usually took from four to six weeks.

It is also true that there were some cases among our patients, in which the wounds did not take so favourable a course and were attended with more or less of inflammation and suppuration. Of wounds inflicted by shell-fragments, those which are most liable to suppurate are: (1) wounds covering an extensive surface, attended with serious mutilation or destruction of the tissue, (2) compound fractures and penetrating wounds of the joints, and (3) wounds into which shell-fragments or other unclean foreign bodies, such as torn pieces of clothes, etc., have been driven. The greater the wound-surface, the greater are the chances of access for various kinds of virus, tissues seriously bruised and mutilated naturally lack the power to withstand infection; and in cases of wounded bone or joints it seems almost impossible to escape a certain amount of suppuration in the complicated course of the healing process. The mere existence of a shell-fragment in a wound has perhaps not much to do with suppuration, but the very fact that it is rough and irregular in shape frequently makes the fragment serve as very favourable medium for soiling the wound by the introduction of unclean foreign bodies, such as torn pieces of clothes. As regards the respective courses of the wounds which were treated by either aseptic or antiseptic method, exclusively, during actions, we have not yet been able to make satisfactory investigations, but we are inclined to believe that not only are the ordinary antiseptic medicines absolutely

ineffective against germs entering wounds with irregular surfaces, such as shell-wounds, but that on the contrary, by reason of the irritation which such medicines cause to the tissues, they are very liable to bring on unfavourable results. It is a phenomenon worthy of special notice that while it is a recognized truth that the surface of a fresh wound has the greatest liability to wound-infection, the wounded men of the crews from the blocking-ships at Port Arthur, as well as those from the *Rurik*, some of whom were rescued after having been several hours in the water, and without receiving first-aid treatment of any kind, did almost as well in the hospital as those who had received every possible first-aid treatment before admission.

Judging from the wounded persons treated in our hospital during the late war, even when wounds became suppurated, the accompanying inflammation was not so serious as greatly to affect their recovery. In many cases the development of the suppurating process was confined only to the immediate sphere of the wound, and it was only in very rare instances that the process spread into the surrounding tissues, where it caused various kinds of secondary complications. With contused or penetrating wounds or the like, in the soft tissues, whenever we found the beginnings of suppuration, we usually managed to have gauze or drainage tubes inserted for several days into the wounds, for the purpose of securing a free escape of pus, or we changed dressings somewhat oftener than usual. In this way, the wounds, as a rule, soon began to present a favourable condition, and it was quite a rare occurrence for cellulitis, or a deeply seated abscess to be formed such as made incisions inevitable in order to procure a succession of counter openings. Similarly, even when wounds of bones, articulations, etc., became suppurated, the only part involved was that which was directly injured, and it was also quite contrary to our former repeated experiences when we found that in a compound fracture, a large part of the extremity became mortified, so that there followed chronic suppuration, or that in a perforating wound of a joint, acute suppuration of the whole articular cavity set in, resulting in the total destruction of the joint, and often threatening the life of the patient. The above statements are not confined only to comparatively simple shell-wounds of bones or to slight wounds of joints, but almost equally so to compound fractures attended with very severe injury of the bone

and having a large wound in the soft tissues as well as to any fracture in which the articular ends of bone were comminuted and which was accompanied by the penetration of shell-fragments. We found that even these last-mentioned wounds healed very much in the same way as did the injuries mentioned above. Of the wounded persons in our hospital, there were twelve cases of compound fractures of the femur, of which eight took a favourable course with the help of the preserving method, that is, with the application of splint and bandage or by the combined use of metal sutures and splints. Out of six persons suffering from shell-wounds at the knee-joints, not only were the injured limbs preserved in four cases, but even the articulations more or less recovered their functions. A patient suffering from a contused and lacerated wound extending from the chest to the upper arm, involving the resection of nearly the whole upper half of the humerus, had his injured limb preserved so as to be still capable of some sort of activity. Indeed, such favourable results as above stated could hardly have been imagined before the application of the antiseptic method and sufficiently prove that the conservative method will more and more extensively be employed in treating severe cases of shell-wounds, bullet-wounds, etc. It is an obvious fact, however, that there are more numerous cases of shell-wounds than bullet-wounds, in which the injured limb can not possibly be preserved. Let us now give a brief statement of the cases of those wounded persons placed in our hospital which terminated in the loss of one of the upper or lower limbs.

Of the wounded persons admitted to our hospital last time, those who finally lost a part of the upper or lower limbs (excepting those who lost fingers or toes) were thirty-two in all; of which twenty had received operation before they were admitted to the hospital, and the remaining twelve had been operated on at the hospital. To classify them according to the locality of amputation they were as follows:—

The thigh 7, the knee-joint 3, the leg 9, the ankle-joint 1, the arm in continuity 8, shoulder-joint 2, the elbow-joint 1, and the forearm in continuity 1. In many of these cases the wounded limbs were found already mutilated or carried away at the time of the injury, or else the upper or lower limbs having been fully destroyed or smashed, only a part of them was found remaining suspended by muscles, tendons, etc. So, in these instances, the operation performed

was nothing more than the removal of the remaining part and the plastic process applied to the broken ends. And this kind of amputation no matter whether it was performed at the front or at the hospital, belonged to the primary amputation, and we had only one case in which the secondary amputation of the injured limb was required after the conservative method had been applied to it. As regards the course of the wounded men on whom amputation was performed, there were, indeed, some cases in which part of wounds became suppurated owing to the fact that their wounds were generally very serious, as stated before; and with those who had received amputation while at the front there had been many chances of being infected during their transportation, etc., but the result of the operation proved mostly very favourable, and death was seen in only one instance (T. Sakamoto) as reported previously. Excepting this one case of death, all the rest already have the surface of their wounds nearly healed, and some have been sent to other hospitals for the application of artificial limbs, and the wounds of others are progressing favourably at the hospital.

Considering that most of the above-mentioned patients had various accompanying wounds besides those of the limbs amputated, yet the rate of deaths was extremely small, and it will be manifest that amputating operations on persons wounded in a naval battle are not of so dangerous a nature as have been imagined. However, as stated before, even in cases of severe destruction of bones and articulations, the preservation of the injured limbs may without much difficulty be attained by means of the conservative methods of treatment, and so we doubt not that in future naval battles amputations will become less and less resorted to.

SECTION III. MANAGEMENT OF CORPSES.

The corpses of those killed while a battle was going on were to be conveyed by bearers to the mortuary. In so doing, when the surface of wounds was very extensive, a large part of their body smashed or blown about, so that it was not easy to identify them, the bearers contrived to collect the remains of each individually, being guided in their discriminations by the garments and other objects belonging to them. With drowned persons strict attention was paid not

to overlook the things they might have left behind. Thus everything possible was done by way of paying them due reverence for their death for the sovereign and country. When the battle was over, inspection was given to the corpses, and on the night of death the intimate friends of the killed and their friends from the same native places were made to keep vigil over the corpses throughout the night as a token of sympathy. In case it happened to be hot so that the corpses were liable to decay, or it was impossible to seize an opportunity to send them home, the remains were cremated at the front, and as tokens of the heroes a part of the adored remains carefully picked out from the cremated ashes, and valuable articles once beloved by them were sent home to their bereaved families, that those relics might be interred side by side with their forefathers; or else the remains (either cremated or not) were buried with due honour and ceremony in the Naval Cemetery at the Naval Stations.

For the mortuary in a ship, the bathroom attached to the sick bay or some other place having the least communication with the crew, had been made ready with gratings spread over the floor, and the corpses having been laid down on them were covered with blankets. However, seeing that if it happens to be very hot weather when the deck has a high temperature on account of conducted heat, and with the side scuttles being shut tight, there is a fear of the corpses decaying very soon—especially so when, the pipe leading to the room happening to be broken by a shell, sea-water enters it and floods over the corpses—we have found it advisable to lay the corpses always on gratings or some wooden stands, and then to cover them with blankets.

CHAPTER III.

STATISTICS OF INJURIES.

SECTION I. KILLED AND WOUNDED IN ACTION.

1. The Russo-Japanese War and its Casualties.

The war between Russia and Japan commences with the night attack of our destroyer divisions upon the enemy's squadron outside Port Arthur on the 9th of February, 1904, and closes with the promulgation of our Imperial Rescript on the Restoration of Peace on the 16th of October, 1905. The course of action taken by our Navy during these twenty and more months is divided into three periods.

The first period extends from the opening of hostilities to the capitulation of Port Arthur; the second from the occupation of Port Arthur to the battle of the Japan Sea; and the third period covers all the time after the Japan Sea engagement until the restoration of peace. During the first period our Navy acted principally against the First Russian Pacific Squadron in Port Arthur and Vladivostok. There were naval battles fought at the entrance of Port Arthur and at Chemulpo, the blockading of Port Arthur, and then encounters in the Yellow Sea and a fight off Ulsan. Our main force was engaged in bottling up the enemy within the harbour of Port Arthur, while our ships, destroyers, torpedo boat flotillas, etc., took turns in going outside the mouth of the harbour and kept a sharp look-out. Our converted gunboats and vedette-boats, constantly approaching the harbour entrance, were busy laying down mechanical mines

and sweeping the sea. Always acting in conjunction with the operation of the Army, we succeeded at last in annihilating the enemy's ships and in seeing Port Arthur capitulate on the 2nd of January, 1905.

In the second period our Combined Squadron collected at the Strait of Tsushima, and after a severe encounter with the enemy's Second Pacific Squadron on the Japan Sea, succeeded in carrying off a complete victory. The third period saw our Northern Squadron co-operating with the Army in the occupation of Sakhalin; and in the midst of our successful career of victory, the war was brought to its conclusion.

Our casualties in these three periods will be seen from the following table, which gives the number of the killed and wounded with their terminations, arranged according to the battles fought:—

TABLE SHOWING THE TERMINATIONS OF THE KILLED AND WOUNDED IN DIFFERENT BATTLES.

Name of Battle.	Instant Death.	Died after Wounded.	Died in Hospital.	Invalid- cd.	Left Hos- pital on Recovery.	Treated & Recovered on Board.	Total.
First Attack on Port Arthur.....	3	2	4	5	20	39	73
Blocking-Ships at Entrance to Port Arthur & Flotillas in Escort...	83	2	—	3	14	25	127
Ships & Vessels at the Block- ading	196	13	9	27	70	144	459
Sunken Ships & Destroyers.....	1,383	10	1	3	75	116	1,593
Battle of Yellow Sea.....	52	18	1	22	59	74	226
Battle of Ulsan.....	36	8	3	7	18	63	135
Battle of Japan Sea.....	88	22	7	51	136	396	700
Co-operations with Land Oper- ations & Northern Squadron.	3	1	—	2	8	18	32
Naval Brigade co-operating with Investing Army.....	34	16	10	33	86	168	347
Total.....	1,883	92	35	153	486	1,043	3,692

The killed and wounded are, as shown above, 3,692 in number, of whom 1,883 were wounded in action and died soon after, or were drowned; 92 had their wounds dressed once at least and died on the ship or at the dressing

stations on land; 35 died on hospital ships or in the Navy or Army Hospitals; 153 were invalided from service on account of the functional disturbances still remaining, after their wounds had been healed in hospital; 486 completely recovered at the Naval Hospitals, the Takeshiki Sick Quarters, or on board the Naval Hospital Ships; and 1,043 received medical treatment on their ships and recovered. The total killed and wounded at the ratio of per 1,000 of the daily average force stands at 86.8. When this is compared with the total casualties of the Chino-Japanese war which was 371 at the rate of 27.48 per 1,000 of force, the casualties of the present war are tenfold in the actual number of the killed and wounded and over three times the rate per 1,000.

Most of the killed during the war were connected with the sinking of our warships and destroyers, being over six times as many as the killed in the three naval battles of the Yellow Sea, of Ulsan, and of the Japan Sea. Neither the three-executed blocking attempts at Port Arthur, nor the operations of the Naval Brigade that participated in the investment of Port Arthur, produced more than 100 in killed; while the first attack upon Port Arthur, and our operations off the coast of Liao-tung and in Sakhalin, were attended with an extremely small number of killed, scarcely worth numbering. On the other hand the wounded were most numerous in the three battles mentioned above, being over one half of the total number of the wounded throughout the war, and four times as many as the losses incurred at the sinking of our warships and destroyers, as shown above. (Cf. Table of Casualties in the Russo-Japanese War appended).

II. Class of Service, Rank, and Office of the Killed and Wounded.

Class of Service :—The killed and wounded were partly men serving on our ships and vessels at the front, and partly those belonging to the Naval Heavy Gun Brigade which participated in the enveloping attack upon Port Arthur. Some of them were struck by the enemy's shells, and some fell victims to submarine mines, and some met their fate while away from their ships on special service. If we classify these cases according as the men served on the ships of the fleet or in the brigade on land, and, further, according to the class of ships to which they belonged, we shall find that most of them came from one or other of our six battle-ships, the next largest number coming from second-class cruisers of the *Yoshino* type. The *Idzumo* and seven other armoured cruisers come third in order. The gunboat classes of the *Heiyei*, *Maya*, and other types, stand next, followed by the Naval Heavy Gun Brigade, the destroyer divisions, the torpedo boat flotillas, cruisers of the *Otowa*, *Chiyoda*, *Itsukushima*, and *Naniwa* classes, and then by special service ships, such as the *Taihoku Maru*, *Kasuga Maru*, etc. The lowest figures are shown by the despatch-vessels *Tatsuta* and *Chihaya*.

If these figures be arranged, however, in the order of percentages to the ships' complements, the 37.39% of the cruisers of the *Yoshino* type (*Chitose*, *Takasago*, *Kasagi*, *Yoshino*) stands first, followed by 35.14% for the Naval Brigade, 22.68% for battle-ships (*Mikasa*, *Asahi*, *Shikishima*, *Hatsuse*, *Fuji*, *Yashima*), 15.50% for coast-defence ships and the gunboat class (*Fuso*, *Suiyen*, *Kaimon*, *Heiyei*, *Tsukushi*, *Banjo*, *Maya*, *Chokai*, *Atago*, *Akagi*, *Oshima*, *Iiyei*), 9.24% for armoured cruisers (*Idzumo*, *Adzuma*, *Tokiwa*, *Asama*, *Yakumo*, *Iwate*, *Kasuga*, *Nisshin*), 6.34% for cruisers of the *Chiyoda* and *Otowa* class (*Akashi*, *Suma*, *Akitsushima*, *Idzumi*, *Chiyoda*, *Otowa*), 5.58% for the *Itsukushima* class (*Itsukushima*, *Matsushima*, *Hashidate*, *Chinyen*), 5.31% for ships of the *Naniwa* type (*Naniwa*, *Takachiho*, *Niitaka*, *Tsushima*), 5.03% for despatch-vessels (*Tatsuta*, *Miyako*, *Chihaya*), and 3.38% for ships on special service (reckoning only those ships which actually sustained losses in killed and wounded). The number of the killed and wounded in the destroyer divisions

and torpedo boat flotillas is lower in rate than that of the Naval Brigade, but not far inferior to that of the battle-ship class.

The killed and wounded, if we distinguish cases resulting from the sinking of ships (inclusive of cases on those ships prior to sinking) from those which were the result of the engagements with Russian Squadrons and arrange in the order of their magnitudes, stands as under:—The sunken ships and vessels were *Hatsuse*, *Yoshino*, *Takasago*, *Heiyen*, *Saiyen*, *Yushima*, *Hayatori*, *Kaimon*, *Akatsuki*, *Miyako*, torpedo boats Nos. 34, 35, 42, 48, 51, 53, and 69. The rates per cent of the whole crew in each case were as follows: Torpedo boat No. 53 (100.00%), *Heiyen* (98.54%), torpedo boat No. 34 (86.36%), *Hatsuse* (84.38%), torpedo boat No. 51 (81.25%), *Yoshino* (77.05%), torpedo boat No. 48 (73.91%), *Takasago* (69.93%), *Hayatori* (60.34%), *Akatsuki* (53.57%), torpedo boat No. 35 (50.00%), torpedo boat Nos. 42 and 69 (34.78% each), *Saiyen* (29.24%), *Kaimon* (14.49%), *Miyako* (10.43%), *Yushima* (7.31%).

Of the ships, etc., that produced over 10% of the complement in killed and wounded, the Naval Brigade (35.14%) stands highest, followed by the *Mikasa* (28.23%), *Nisshin* (21.58%), special service ship *Taihoku Maru* (17.14%), *Iwate* (15.70%), *Maya* (13.64%), *Chiyoda* (13.07%), *Itsukushima* (12.50%), *Otowa* (11.44%) and *Chokai* (11.43%)—the two ships *Yageyama* and *Uji* having had no killed or wounded throughout the war, while all other ships that participated in the naval warfare sustained more or less of loss through casualties. With destroyers, the figures stand in the following order: *Oboro* (33.33%), *Ikadzuchi* (31.25%), *Kasumi* (23.81%), *Shiranui* and *Asashio* (each 23.44%), *Akebono* (16.13%), *Harusame* and *Yugiri* (each 13.85%), *Shirakumo* (12.31%); all the others excepting the *Kagero*, *Inaduma* and *Yugiri* were below 10%.

With torpedo boats, those that produced over 30% were torpedo boats Nos. 32, 38, 68, and 58; those over 20% the *Tubame*, *Aotaka*, and No. 66; and those over 10% Nos. 36, 44, 46, 67 and 59; the remaining 10 torpedo boats had their casualties not amounting to 10%.

Rank of the Killed and Wounded:—The killed and wounded in action, when classed according to their ranks were as follows:—The killed among

commissioned officers and others of equal rank numbered 209, and the wounded 172; the killed among petty officers numbered 409, and the wounded 349; while the killed among the men of seamen class with others of equal rank were 1,356 in number, and the wounded 1,130; of civilians (hired as domestics) 36 were killed and 31 wounded. Rated at per 1,000 of the average number per day of enlisted men and civilians, the officers and others of equal rank stand at the rate of 58.82 in killed and 48.41 in wounded; petty officers, at 53.76 in killed and 45.87 in wounded; and the men of the seaman class and others of equal rank, at 45.62 in killed and 38.01 in wounded; the civilians showing 46.63 in killed and 40.16 in wounded.

When the killed and wounded are combined, their rates run as below: Officers and others of equal rank (107.23), petty officers (99.63), civilians (86.79), and men of seaman class and others of equal rank (83.63). When rated at per 1,000 of the average force per day on our ships and vessels at the front, they come up in this order: Officers and others of equal rank, at the rate of 97.12 in killed and 79.33 in wounded; petty officers, at 92.45 in killed and 68.81 in wounded; men, at 83.19 in killed, and 57.08 in wounded; and civilians, at 73.32 in killed and 63.14 in wounded. When the killed and the wounded are combined, the results come out in the following order: Officers and others of equal rank (176.44), petty officers (161.26), men (140.27) and civilians (136.46).

When the killed and wounded are distributed among the different branches of the service, and the officers and men of the each branch are taken together in the aggregate, the executive branch shows 2,316 killed and wounded among officers and men; the signal branch 139; the engineer branch 930; and the other branches (combined) 240, with 67 among the civilians (hired domestics).

When the killed and wounded in different branches are rated at per 1,000 of the whole strength present in each branch at the end of the year 1904, the signal branch shows the highest figures, the rates gradually descending to executive branch, civilians, engineering, and finally to the other branches (combined). As regards the number of killed in action the order stands as under:

Signal, engineer, executive, civilian, other branches (artisan, medical, accountant, and band); as regards the ratio of the wounded per 1,000 of strength in action they stand thus: Signal, executive, civilians, other branches, the engineer branch coming last. The officers and petty officers show a greater rate of casualties than the blue-jackets and civilians, while the signal branch produced the highest rate. In the engineer branch the wounded are comparatively few, the cases of killed being in the majority. These variations of figures are due to the different nature of the service in different branches—the men of the signal branch being more exposed to the enemy's shells than men of other branches, while the men of the engineer branch who are constantly at work at the bottom of their ships, though well protected from shells, experience much difficulty in making good their escape at any time of sudden emergency. Hence the large number of death in this branch. On the other hand, petty officers, men, and civilians of the medical and accountant branches, while performing their duties in different parts of the ship, in the rescue and transportation of the fallen in battle, or in carrying ammunition, etc., in the midst of an engagement, are more exposed to the risk of death or wounds. That so large a number of officers were among the killed and wounded, is most probably due to their going ahead of the rest to give directions and commands. The table below shows the ranks and offices of the killed and wounded in different engagements during the war:—

Battles.	Warrant Officers & Above.					
	Executive Branch.	Signal Branch.	Engineer Branch.	Medical Branch.	Accountant Branch.	Others.
First Attack on Port Arthur { Killed. Wounded.	3 13	1 —	— 1	— —	— —	— —
Block-Ships at Entrance to Port Arthur. { Killed. Wounded.	12 3	— —	5 1	— —	— —	— —
BLOCKADE OF PORT ARTHUR.						
Warships. { Killed. Wounded.	6 11	— —	— —	— 1	1 —	1 1
Destroyers { Killed. Wounded.	— 5	— —	— 2	— 3	— 1	— —
Torpedo Boats { Killed. Wounded.	8 8	— —	1 3	— —	— —	— —
Converted Gunboats { Killed. Wounded.	1 5	— —	— 2	— —	— —	— —
Vedette-Boats. { Killed. Wounded.	7 —	— —	1 —	— —	— —	— —
Sea-Sweeping Boats { Killed. Wounded.	— 1	— —	— —	— —	— —	— —
Total. { Killed. Wounded.	22 30	— —	2 7	— 4	1 1	1 1
Battle of Yellow Sea { Killed. Wounded.	9 17	2 —	2 1	— —	2 —	1 —
Battle of Ulsan..... { Killed. Wounded.	2 6	— —	— 1	— 1	— 1	— —
Battle of Japan Sea..... { Killed. Wounded.	7 39	— 1	— 6	— 3	— 3	— 2
Total. { Killed. Wounded.	18 62	2 1	2 8	— 4	2 4	1 2
Sunken Warships, & Destroyers... { Killed. Wounded.	73 13	— —	37 2	9 2	6 1	4 1
Co-operation with Land Forces & Northern Squadron { Killed. Wounded.	1 3	— —	— —	— —	— 1	— —
Naval Brigade { Killed. Wounded.	7 7	— —	— —	— —	— —	— —
Aggregate { Killed. Wounded.	136 131	3 1	46 19	9 10	9 7	6 4

Petty Officers				Men				Civilians (Hired Do- mestics).	Total	General Total.
Executive Branch.	Signal Branch.	Engineer Branch.	Others.	Executive Branch.	Signal Branch.	Engineer Branch.	Others.			
2 9	— —	— —	— —	2 31	1 6	— 2	— —	— 2	9} 64}	73
13 4	1 2	9 6	— —	16 8	— —	29 18	— —	— —	85} 42}	127
17 8	1 —	1 2	— 3	26 36	1 —	3 6	1 5	1 2	59} 75}	134
2 11	— —	— 9	— 1	4 16	— 2	7 18	1 —	— 3	14} 71}	85
5 4	— —	10 3	— —	11 7	— —	22 9	— 1	— —	57} 35}	92
4 6	— 1	1 3	— 1	7 15	— 2	— 4	1 —	— —	14} 39}	53
18 —	1 1	12 2	— —	12 8	— 1	12 2	— —	— —	63} 14}	77
2 2	— —	— 1	— —	6 2	— 1	3 —	— —	— —	11} 7}	18
48 31	2 2	24 20	— 5	66 84	1 6	47 39	3 6	1 5	218} 241}	459
7 18	4 2	2 8	5 4	20 64	5 12	9 16	3 6	— 7	71} 155}	226
7 13	— 1	1 1	1 4	32 37	1 4	3 12	— 3	— 4	47} 88}	135
12 87	— 6	4 13	2 16	72 304	3 16	12 65	1 16	4 6	117} 583}	700
26 118	4 9	7 22	8 24	124 405	9 32	24 93	4 25	4 17	235} 826}	1,061
107 17	15 2	103 14	28 5	518 87	32 2	368 36	68 6	31 6	1,399} 194}	1,593
1 2	— 2	— 1	— 1	2 13	— 2	— 1	— 1	— 1	4} 28}	32
9 49	1 1	— 1	1 2	41 216	— 3	— 1	1 7	— —	60} 287}	347
206 230	23 18	143 64	37 37	769 844	43 51	468 190	76 45	36 31	2,010} 1,682}	3,692

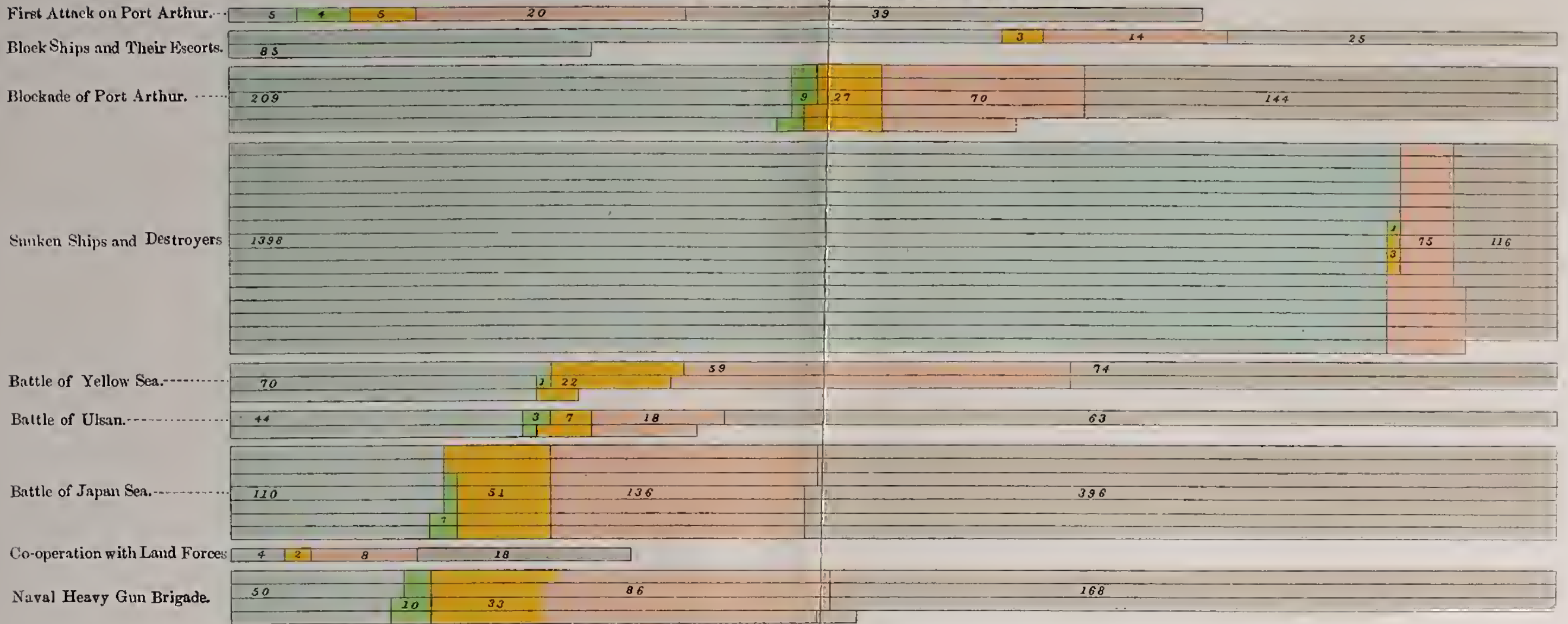
SECTION II. CAUSES OF INJURIES.

The killed and wounded in action in the present war include not only those who were directly or indirectly struck by the enemy's shells, mechanical mines, etc., but also those who received injuries from any unavoidable cause while firing guns or engaging in other military operations even though they had no direct relation to the hostile weapons. Among the wounds inflicted by the enemy's shells, there are, besides those due to the shells themselves, those that are due to the fragments of shells or splinters of ship's timber and iron platings, etc., shattered by the explosion of shells, also such as were due to the explosion of our own ammunition caused by the enemy's shells. The injuries caused by the enemy's mechanical mines were due to the havoc wrought by detonating gases, the flight of splinters, the heeling and sinking of vessels, etc. Besides all these, there were some due, not directly to any of the enemy's weapons, but to such causes as the shock of our own firing whereby the ears were damaged, or to various accidents of military warfare, or to striking against various substances while swimming in the water after the sinking of a ship. These causes are so multifarious that it is considered necessary to make a distinction of injuries from other causes than the enemy's weapons under the denomination of "Sundries" as being quite distinct from those inflicted directly or indirectly by the enemy's weapons which belong properly to warfare in the narrower sense of the word.

I. Injuries Proper to Warfare.

The causes of wounds inflicted in naval warfare vary with different conditions of engagement. In our first attack upon Port Arthur, for instance, which was an engagement with an enemy's fortress and fleet at the entrance of their own harbour, the injuries suffered were due to the discharge of shells. Such, also, was the case with the battle of the Yellow Sea and the fight off Ulsan, which were direct engagements with the enemy's fleet; whereas those inflicted in the blocking attempts on Port Arthur were due, some to the enemy's shells, some to their bullets, some to the explosion of mines, and some to the sinking of the ships. Among those who were killed on land, some deaths may have been due

CASES OF THE KILLED AND WOUNDED OF JAPANESE OFFICERS AND MEN DURING THE RUSSO-JAPANESE WAR. THE KILLED AND WOUNDED IN EVERY BATTLE.

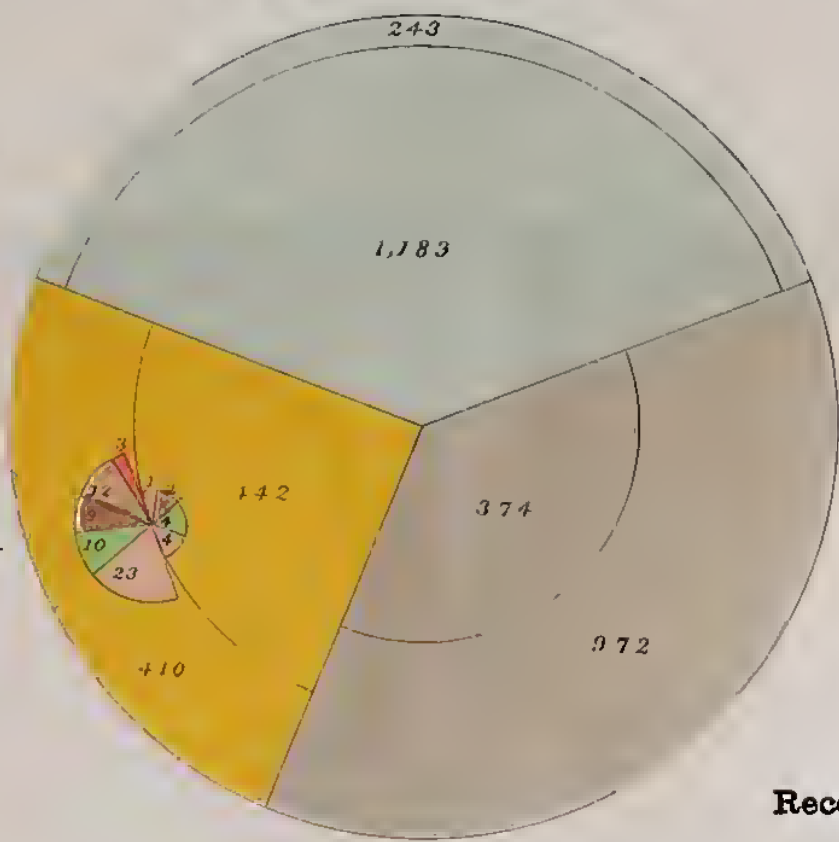


Killed.
 Died in hospitals.
 Invalided.
 Recovered in Hospital.
 Recovered on Board.

Total Number of the Killed and Wounded.
(3,692 persons.)

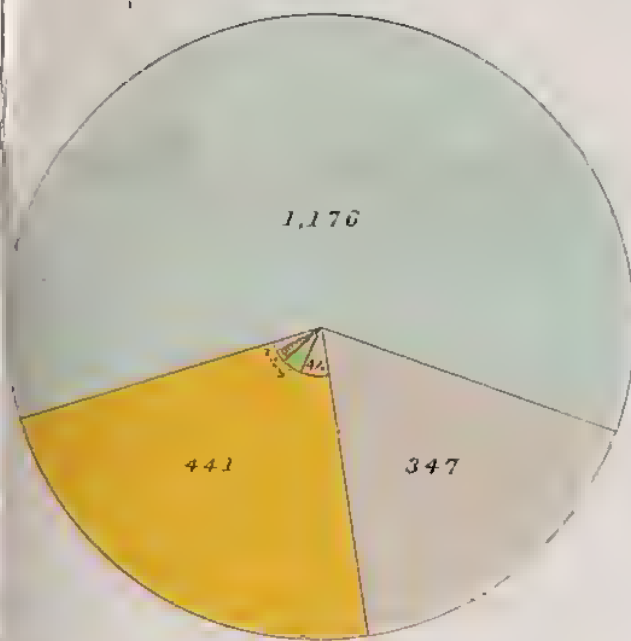
Inner segments show deaths, outer wounds.

Mechanical Mines.
 Shells.
 Shrapnell.
 Bullets.
 Fish Torpedoes.
 Gunpowder Explosions.
 Close Combats.
 Other Cases.



CAUSES OF THE KILLED AND WOUNDED IN ACTION.

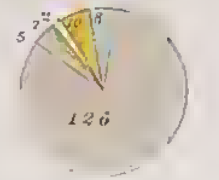
Killed in Action.
(1,975 persons.)



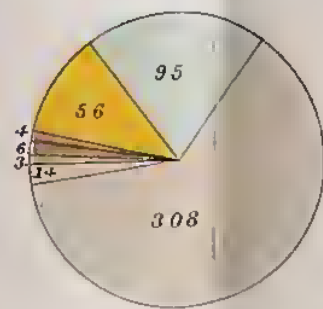
Died in Hospitals. (35 persons.)



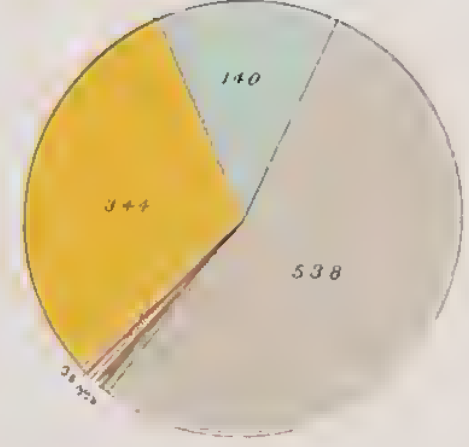
Invalided. (153 persons.)



Recovery in Hospitals.
(486 persons.)



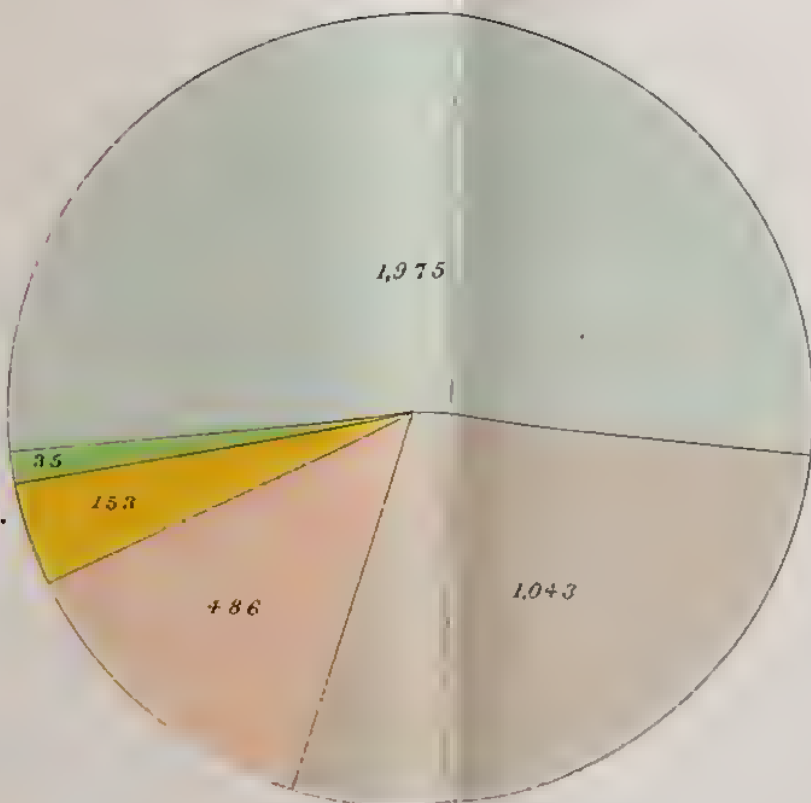
Recovery on Board.
(1,043 persons.)



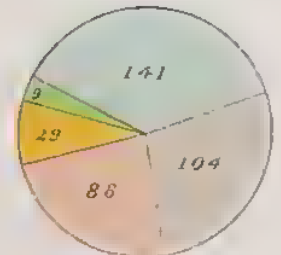
COMPARISON BETWEEN CASES OF THE KILLED AND WOUNDED IN THE RUSSO-JAPANESE WAR AND THOSE IN THE CHINO-JAPANESE WAR.

The Russo-Japanese War.
(3,692 persons.)

Killed in Action.
 Died in Hospitals.
 Invalided from Service.
 Recovered in Hospitals.
 Recovered on Board.



The Chino-Japanese War.
(371 persons.)





Causes.	First Attack on Port Arthur.	Block Ships & Floating Batteries in Escort.	Reconnaissance & Blockade.	Destroyers, Torpedo Boats, Cruisers, Gunboats, Sea-Sweeping Boats, Vedette-Boats.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Army & Northern Squadron.	Naval Heavy Gun Brigade & Advanced Observation Station.	Aggregate.
SHELLS											
Direct Projectiles.											
Shell-Fragments & Gun-powder (pulverized wounds) {	Killed....	—	—	—	—	1	—	3	—	2	6
	Wounded.	—	—	—	—	3	—	8	—	6	17
Fragments of Shells..... {	Killed....	4	3	—	23	21	3	50	—	37	141
	Wounded.	16	19	—	38	27	11	112	—	52	275
Gas of Exploded Shells (pulverized wounds) {	Killed....	—	—	—	—	1	—	1	—	—	2
	Wounded.	3	2	—	2	27	—	35	—	30	99
Shell Exploded on the Sea {	Killed....	—	—	—	—	—	—	1	1	—	2
	Wounded.	11	—	—	9	8	—	6	5	—	39
Secondary Explosion {	Killed....	—	—	15	—	8	41	8	—	1	73
	Wounded.	—	—	16	—	13	34	8	—	—	71
Total {	Killed ...	8	7	15	35	46	46	90	2	55	304
	Wounded.	30	21	16	49	78	46	169	5	90	504
Indirect Projectiles.											
Splinters of Iron, Wood, Brass, Glass, Ropes, Screw, Rivets, etc. {	Wounded.	—	—	—	—	—	—	3	—	—	3
	Killed. ...	—	2	—	3	11	5	40	—	—	61
Splinters of Cartridge, Steam-Heaters, Stanchions, Funnels, Ventilators, {	Wounded.	1	—	—	—	2	—	4	—	—	7
Wires for Wireless Telegraphs, Mantlets, Torpedo {	Killed. ...	2	2	—	2	12	—	12	—	—	30
Tubes, Water Pipes, Water Cistern & other Ship's Timbers. {	Wounded.	—	—	—	12	9	—	11	—	—	32
Escape of Steam {	Killed. ...	—	—	—	1	—	—	11	—	—	12
Exploded Fragments of Gun {	Wounded.	—	—	—	—	—	—	4	—	—	4
	Killed. ...	—	—	—	—	—	—	11	—	—	11

Blows, Pressure, Falls, Collision	Killed. ...	—	—	—	—	—	—	—	—	—	—
	Wounded.	—	1	—	—	—	—	5	—	3	9
Sand, Pebbles, Wooden Fragments, Sand-Bags.....	Killed. ...	—	—	—	—	—	—	—	—	1	1
	Wounded.	—	—	—	—	—	—	—	—	53	53
Unknown Indirect Projectiles	Killed. ...	—	—	—	—	1	—	3	—	1	5
	Wounded.	—	2	—	7	—	2	3	36	—	55
Total.....	Killed. ...	1	—	—	12	—	12	—	25	—	52
	Wounded.	2	7	—	13	—	25	8	115	—	231
Direct & Indirect Projectiles combined	Killed. ...	—	—	—	—	—	10	—	—	—	10
	Wounded.	1	—	—	—	—	1	—	—	2	4
Unknown Agents.....	Killed. ...	—	1	4	—	—	2	1	—	—	8
	Wounded.	21	4	—	8	—	24	8	111	—	233
Aggregate	Killed. ...	9	8	19	47	—	70	47	115	2	374
	Wounded.	54	32	16	70	—	128	62	395	5	972

MECHANICAL MINES

Direct Projectiles.

Pieces of Iron & Other matter	Killed. ...	—	—	31	51	—	—	—	—	—	82
	Wounded.	—	—	27	15	—	—	—	—	—	42
Exploded Gas	Killed. ...	—	—	—	—	—	—	—	—	—	—
	Wounded.	—	—	12	—	—	—	—	—	—	12
Total	Killed. ...	—	—	31	51	—	—	—	—	—	82
	Wounded.	—	—	39	15	—	—	—	—	—	54

Indirect Projectiles.

Flying Pieces of Iron, Wood, Brass & Coal Lumps.....	Killed. ...	—	—	—	—	—	—	—	—	—	—
	Wounded.	—	—	3	4	5	—	—	—	—	12
Splinters of Ship's Timbers, Cartridges, Stanchions, Capstans, Derrieks, etc. & other broken Pieces of Furniture...	Killed. ...	—	—	—	—	—	—	—	—	—	—
	Wounded.	—	—	1	6	3	—	—	—	—	10

Causes.		First Attack on Port Arthur.	Block Ships & Flo- tillas in Escort.	Reconnaissance & Blockade.	Destroyers, Torpedo Boats, Converted Gun- boats, Sea-sweeping Boats, Velleto-boats.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Army & Northern Squadron.	Naval Heavy Gun Brigade & Advanced Observation Station.	Aggregate.
MECHANICAL MINES												
Indirect Projectiles.												
Fallen & struck by Blows or by Shocks.....	{ Killed.	—	—	—	—	—	—	—	—	—	—	—
	{ Wounded.	—	—	—	8	31	—	—	—	—	—	39
Explosion of Magazine.	{ Killed.	—	—	—	—	1	—	—	—	—	—	1
	{ Wounded.	—	—	—	—	21	—	—	—	—	—	21
Escape of Steam.	{ Killed.	—	—	—	—	—	—	—	—	—	—	—
	{ Wounded.	—	—	—	—	2	—	—	—	—	—	2
Unknown Indirect Projectiles	{ Killed.	—	—	—	—	—	—	—	—	—	—	—
	{ Wounded.	—	—	—	3	24	—	—	—	—	—	27
Total.....	{ Killed.	—	—	—	—	1	—	—	—	—	—	1
	{ Wounded.	—	—	4	21	86	—	—	—	—	—	111
Direct or Indirect, un- known.....	{ Killed.	—	—	—	21	1,079	—	—	—	—	—	1,100
	{ Wounded.	—	—	1	20	57	—	—	—	—	—	78
Aggregate	{ Killed.	—	—	31	72	1,080	—	—	—	—	—	1,183
	{ Wounded.	—	—	44	56	143	—	—	—	—	—	243
Shrapnel Shells & their In- direct Projectiles.	{ Killed.	—	1	—	—	—	—	—	—	1	2	4
	{ Wounded.	—	1	—	—	—	—	—	—	5	17	23
Bullets.....	{ Killed.	—	2	—	—	—	—	—	—	1	1	4
	{ Wounded.	—	3	3	—	—	—	—	—	3	1	10
Fish Torpedoes.....	{ Killed.	—	1	—	—	—	1	—	—	—	—	2
	{ Wounded.	—	—	—	—	—	9	—	—	—	—	9
Gun-Cotton exploded	{ Killed.	—	—	—	1	—	—	—	—	—	—	1
	{ Wounded.	—	—	—	12	—	—	—	—	—	—	12
Close Combat	{ Killed.	—	—	—	—	—	—	—	—	—	—	—
	{ Wounded.	—	—	—	3	—	—	—	—	—	—	3

Aggregate	{	Killed ...	—	4	—	1	—	1	—	—	2	3	11
		Wounded.	—	4	3	15	—	9	—	—	8	18	57
Grand Total	{	Killed ...	9	12	50	120	1,080	71	47	115	4	60	1,568
		Wounded.	54	36	63	141	143	137	62	395	13	223	1,272

N.B. For simplifying the table, we have inserted the causes of injury, such as explosion gas, steam, etc., under the head of projectiles, direct or indirect.

As shown above, the casualties in the Navy were 1,568 in killed and 1,272 in wounded; of these 374 were killed by shells and 972 wounded; mechanical mines account for 1,183 killed and 243 wounded: the killed by shrapnel shells, bullets, torpedoes, gun-cotton and hand-to-hand fight numbered 11, and the wounded 57.

II. Injuries from Causes other than Hostile Weapons.

The causes of injuries suffered during hostile operations of various kinds with no relation to the direct or indirect projectiles of hostile shells, mines, etc., i.e. sundry injuries are in the first place, deaths by drowning, and deaths and injuries due to the collisions and sinking of ships, and secondly, the injuries to the ears caused by the shock of firing and wounds sustained whilst working guns, transporting ammunition, handling at engines and other such work. They are as shown below:—

CAUSES OF INJURIES OTHER THAN HOSTILE WEAPONS.

Causes.	First Attack upon Port Arthur.	Block Ships & Flotillas in Escort.	Blockade of Port Arthur.	Destroyers, Torpedo Boats, Converted Gun-boats, Sweeping Boats, Vedette-Boats.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with our Army & Northern Squadron.	Naval Heavy Gun Brigade & Advanced Observation Station.	Aggregate.
SUNKEN SHIPS & VESSELS.											
Drowned { K.	—	—	2	16	319	—	—	2	—	—	339
{ W.	—	—	—	—	—	—	—	—	—	—	—
VARIOUS OPERATIONS CONNECTED WITH FIRING OUR GUNS.											
Ear hurt while { K.	—	—	—	—	—	—	—	—	—	—	—
firing { W.	3	—	6	9	—	7	14	49	12	1	101

Causes.	First Attack upon Port Arthur.	Block Ships & Flotillas in Escort.	Blockade of Port Arthur.	Destroyers, Torpedo Boats, Gunboats, Landing, Sea-Sweeping Boats, Vedic-Boats.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with our Army & North Squadron.	Naval Heavy Gun Brigade & Advanced Observation Station.	Aggregate.
VARIOUS OPERATIONS CONNECTED WITH FIRING OUR GUNS.											
Firing Guns, {K. W.	— —	— —	— 1	— —	— —	— —	— 2	— 15	— —	— 6	— 24
Breach Lock, {K. W.	— —	— —	— —	— —	— —	— 1	— 1	— 10	— 1	— 1	— 14
Shells {K. W.	— 4	— —	— —	— 1	— —	— 3	— 2	— 16	— —	— 3	— 29
Cartridge- Cases..... {K. W.	— 1	— —	— 1	— 1	— —	— 1	— 3	— 20	— —	— 1	— 28
Gun Port..... {K. W.	— —	— —	— —	— —	— —	— —	— —	— 3	— —	— —	— 3
Ammunition Hoist {K. W.	— 1	— —	— —	— —	— —	— 2	— —	— 7	— —	— —	— 10
VARIOUS OPERATIONS DURING BATTLE & BEFORE THE ENEMY.											
Mechanical Mines {K. W.	— —	— —	— —	— 4	— —	— —	— —	— —	— —	— —	— 4
Fish-Torpedoes {K. W.	— —	— —	— —	— —	— —	— 1	— —	— 2	— —	— —	— 3
Sharp Blades & Explosives. {K. W.	— —	— 4	— —	— 2	— —	— —	— —	— 1	— —	— —	— 7
Protecting from Water leaking. {K. W.	— 1	— —	— —	— —	— —	— —	— —	— 12	— —	— —	— 13
General Operations for Battle. {K. W.	— —	— —	— —	— —	— —	— —	— 1	— 15	— —	— —	— 16
General Operations on the Sea {K. W.	— —	— —	— 4	— —	— —	— —	— —	— 1	— 1	— —	— 4 2
Collision of Steamboat armed or not.. {K. W.	— —	— —	— —	— —	— —	— —	— —	— 5	— 1	— —	— 6

IN THE EVENT OF SHIPS SINKING.												
On Board Ships	{K. W.	—	—	—	—	—	—	—	—	—	—	—
While Swimming.	{K. W.	—	—	—	5	30	—	—	2	—	—	37
On Board Life Boats & Vessels	{K. W.	—	—	—	—	—	—	—	—	—	—	—
Causes unknown.	{K. W.	—	—	—	—	—	—	—	7	—	—	7
VARIOUS OPERATIONS AT ENGINEER'S SECTION.												
Boilers Leaking	{K. W.	—	—	2	—	—	—	—	—	—	—	2
From Contact with Fire Rake	{K. W.	—	—	—	1	—	—	—	4	—	—	5
Tumbled Down	{K. W.	—	—	1	—	—	1	1	1	—	—	4
Coal Masses.	{K. W.	—	—	—	—	—	—	2	3	—	—	5
Inspecting, Oiling & Repair Work.	{K. W.	—	—	—	—	—	1	—	13	—	—	14
OPERATION ON LAND.												
Fallen into Gullies in Dark Night.	{K. W.	—	—	—	—	—	—	—	—	—	5	5
Transporting Ammunition.	{K. W.	—	—	—	—	—	—	—	—	—	4	4
Run over by Wheels.	{K. W.	—	—	—	—	—	—	—	—	—	9	9
Thrown by Guns, Cradles, Carriages etc.	{K. W.	—	—	—	—	—	—	—	—	—	6	6
Miscellaneous Works.	{K. W.	—	—	—	—	—	—	—	—	—	23	23
UNKNOWN CAUSES.	{K. W.	—	73	1	23	—	—	—	—	—	—	97
		—	1	—	2	—	1	—	2	—	—	6
Total	{K. W.	—	73	9	39	319	—	—	2	—	—	442
		10	6	12	25	51	18	26	188	15	59	410

N.B. "K" is used for Killed; "W" for Wounded.

According to the above table, the killed from causes other than hostile weapons are 442, and the wounded 410, many of them being slight cases.

SECTION III. STATISTICS OF INJURIES.

I. General Remarks.

There were great varieties in the wounds and injuries sustained in the Navy. The varieties were due not only to the causes which produced the wounds, as e.g. shells, shrapnels, mines, etc., but also to the degrees of severity which the wounds presented. We had cases which were truly pitiable to behold: we had others which were healed with a single treatment. In the cases, too, of men who sustained many injuries at the same time, some of the wounds healed before the others. Hence when a man was transferred from his ship to one of the hospital ships or to a hospital, it often happened that some of the wounds had already been healed. This will account for the apparent discrepancies between the numbers of wounds credited to a man on his own ship at the time of injury and those credited to him some time later when examined at a hospital. With cases of instant death, and of death a short time later from the effect of wounds, the records of minor wounds are sometimes omitted in the confusion of a battle, only mortal injuries, such as constituted the real cause of death, being taken into account. The total number of wounds enumerated for a whole naval campaign can, therefore, never be quite accurate. With the help of death-certificates, certificates of injuries, the daily sick books and clinical records of hospitals and hospital ships, as submitted by the chief medical officers in charge, we have prepared a new set of medical records of killed and wounded, with calculations and enumerations, based thereupon, of the wounds and their localities, and arranged according to the terminations of the wounds. The results of our labours are subjoined.

**WOUNDS AND INJURIES CLASSIFIED AS TO THEIR LOCALITY
AND TERMINATION.**

Locality of Wounds.	Principal Wounds.							Wounds of Secondary Importance.		Total.
	Instant Death.	Died after Wounded.	Died at hos- pital.	Invalided.	Serious Wounds healed at Hospital.	Slight Wounds healed at Hospital.	Treated on Board.	Serious.	Slight.	
Extensive Parts of the Body	51 (13.18)	6 (5.26)	4 (8.51)	4 (2.60)	12 (9.16)	1 (0.13)	— —	3 (0.96)	2 (0.22)	83 (2.06)
Head, Face, & Neck	124 (32.04)	20 (17.54)	8 (17.02)	22 (14.29)	23 (17.56)	228 (29.34)	336 (27.86)	50 (15.92)	221 (24.34)	1,032 (25.56)
Chest, Abdomen, & Lumbar Region ...	123 (31.78)	26 (22.81)	12 (25.53)	6 (3.90)	19 (14.50)	84 (10.81)	168 (8.96)	37 (11.78)	120 (13.22)	535 (13.25)
Upper Limbs (inclu- sive of scapular re- gion)	43 (11.11)	9 (7.89)	6 (12.77)	52 (33.77)	24 (18.32)	225 (38.96)	361 (29.93)	101 (32.17)	232 (25.55)	1,053 (26.08)
Lower Limbs (inclu- sive of gultal re- gion)	46 (11.89)	53 (46.49)	17 (36.17)	70 (45.45)	53 (40.46)	239 (30.76)	401 (33.25)	123 (39.17)	333 (36.67)	1,335 (33.06)
Total	387 (100.00)	114 (99.99)	47 (100.00)	154 (100.01)	131 (100.00)	777 (100.00)	1,206 (100.00)	314 (100.00)	908 (100.00)	4,038 (100.01)

Remarks.—The above shows the total number of wounds in the whole body excepting the injuries of the ear. The serious and the slight wounds in the column of “wounds of secondary importance”, being cases of “instant death”, “death after wounded,” “entered hospital” and “invalided,” are those suffered beside the main wounds. The slight wounds of the seriously wounded who left hospital on recovery are included in the column under slight wounds enumerated above.

If, in the next place, we take the wounds (injuries of the eye and ear ex-

cepted) arranged in the order of frequency in the aggregate, and quite regardless of gravity or the reverse, the list comes out in the following order: Contused wounds, contusions, abrasions and abraded wounds, scalds and explosion wounds, blind wounds, lacerated and mutilated wounds, perforating wounds, wounds attended with extensive loss of soft tissues, penetrating wounds, mutilations of the whole body, other wounds. This may be seen from the table given below. Contused wounds, the most numerous class, number 1,251. Next come contusions of all sorts numbering 661 in all. Abrasions and abraded wounds, 507 in all, are mostly wounds by indirect projectiles, not caused by the shells themselves, but by e.g. iron and wooden splinters of other objects scattered by the bursting of shells. Those cases in which the cutis has been stripped off are here denominated abraded wounds, while those in which the epidermis had merely been scratched off are placed under the name of abrasions. But abrasions and abraded wounds mostly present more or less of suggillation and swelling as well; and, for this reason the most conspicuous cases have been enumerated with contused instead of with abraded wounds. Under blind wounds we reckoned such contused wounds as had a depth greater than the diameter at the entrance, and so forming a wound track. Such deep blind wounds as may be seen e.g. in bullet-wounds, were extremely few in number, aggregating altogether about 387. By lacerated wounds we mean that kind of injury in which the tissues have been torn, though the upper and the lower halves have good connection; and by mutilated wounds, that kind of injury in which either the body or a part of it is crushed and rent asunder. There were altogether 257 wounds of these two kinds. "Wound with loss of soft tissues" is the name given to wounds in which both skin and other soft tissues have been extensively lost. By penetrating wounds are meant such wounds as are made by the penetration of shell-fragments or splinters into the cavities of the body. All other wounds, e.g. such as are denominated "lacerations" etc., are after all nothing more than long and narrow contused wounds, while incised and punctured wounds, both being such as have been incurred in the discharge of the duty, with no relation to the direct or indirect projectiles, are denominated as "Sundries." These were extremely few.

CASUALTIES OF THE WAR, 1904-5.
(Inclusive of Injuries of the Ear & Eye.)

Denomination.	Principal Wounds.							Wounds of Secondary Importance.		Total.
	Died instantly.	Died after Wounded.	Died at Hospital.	Invalided.	Serious Wounds recovered at Hospitals.	Slight Wounds recovered at Hospitals.	Recovery on Board.	Serious.	Slight.	
Mutilation of the Whole Body	23	—	—	—	—	—	—	—	—	23
Extensive Burns & Scalds of the Body	28	6	3	4	12	—	—	—	—	53
*Lacerated & Mutilated wounds	185	30	4	16	—	—	—	22	—	257
Wounds with Loss of Soft Tissues (with fractures.)	6	8	9	6	—	—	—	15	—	44
Wounds attended with Loss of Soft Tissues	5	7	2	7	13	—	—	21	—	55
Perforating Wounds attended with Injury of Viscera & Bones	16	7	2	—	—	—	—	—	—	25
Perforating Wounds with Fracture of Bones	11	12	2	10	3	—	—	12	2	52
Perforating Wounds	11	1	1	1	10	20	6	13	28	91
Penetrating Wounds (head, abdomen, chest)	49	18	5	3	3	—	—	4	—	82
Blind Wounds with Fractures of Bones.	4	3	5	16	17	5	—	16	—	66
Blind Wounds	1	4	—	7	23	97	30	22	137	321
Lacerated Wounds with Fractures...	1	—	1	—	1	—	—	2	—	5
Contused Wounds with Fractures	34	14	5	54	20	18	1	102	18	266
Contused Wounds	3	2	2	11	9	205	370	18	365	985
Simple Fractures	8	1	2	7	5	—	1	—	—	24
Contusions, Viscera injured	—	1	4	—	5	—	—	—	—	10
Contusions with Fractures.....	2	—	—	—	2	3	—	11	—	18
Contusions	—	—	—	1	1	157	413	2	59	633
Abrasions & Abrased Wounds	—	—	—	—	—	133	209	—	165	507
Explosion Wounds of Circumscribed Part.....	—	—	—	—	—	41	49	20	69	179
Scalds of Circumscribed Parts	—	—	—	—	—	78	79	30	41	228
Incised & Punctured Wounds	—	—	—	—	—	11	34	1	11	57
Injuries of the Eye.....	—	—	—	11	7	9	14	3	13	57
Injuries of the Ear	—	—	—	32	—	54	130	—	4	220
Total	387	114	47	186	131	831	1,336	314	912	4,258

* About a hundred of cases were accompanied by injuries of viscera.

TABLE SHOWING THE

Denomination.		First Attack on Port Arthur.	Block Ships & Flotillas in Escort.	Ships & Vessels in Blockading.
INVALIDED FROM SERVICE.				
Resulted in Impairment of Hearing.				
Rupture of Both Tympanic Membranes	Wounds {proper sundry	— —	— —	3(1) —
Rupture of Left Tympanic Membrane	Wounds {proper sundry	— —	— —	— —
Rupture of Right Tympanic Mem- brane	Wounds {proper sundry	— —	— —	— —
Rupture of Right Tympanic Mem- brane (chronic catarrhal otitis).....	Wounds {proper sundry	— —	— —	— 1(1)
Concussion of Left & Right La- byrinths	Wounds {proper sundry	— —	— —	— —
Rupture of Left & Right Tympanic Membranes, & Concussion of Left & Right Labyrinths	Wounds {proper sundry	— —	— —	1(m) —
Rupture of Left & Right Tympanic Membranes, & Concussion of Right Labyrinth	Wounds {proper sundry	— —	— —	— —
Rupture of Left Tympanic Membrane & Concussion of Right Labyrinth ...	Wounds {proper sundry	— —	— —	— —
Thickening of Both Tympanic Mem- branes	Wounds {proper sundry	— —	— —	— —
Concussion of Bilateral Tympanic Membranes, & Thickening of Right Tympanic Membrane	Wounds {proper sundry	— —	— —	— —
Total	Wounds {proper sundry	— —	— —	4(1) 1(1)
Recovery				
Rupture of Left & Right Tympanic Membranes	Wounds {proper sundry	— —	— —	1 —

INJURIES OF THE EARS.

Sunken Ships.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Army & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
—	3	—	1	—	6(1)	13(2)
—	—	—	—	—	—	—
—	—	—	1	—	1	2
—	—	—	—	—	—	—
—	—	—	1(1)	—	2	3(1)
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	1(1)
—	—	—	2	—	1	3
—	—	—	2(2)	—	—	2(2)
—	—	—	3	—	—	4
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	1(1)	—	—	1(1)
—	—	—	1	—	—	1
—	—	—	—	—	—	—
—	—	—	—	—	1	1
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	1(1)	—	—	—	1(1)
—	3	—	9(1)	—	11(1)	27(3)
—	—	1(1)	3(3)	—	—	5(5)
—	—	—	—	—	—	1
—	—	—	—	—	—	—

Denomination.		First Attack on Port Arthur.	Block Ships & Flotillas in Escort.	Ships & Vessels in Blockading.
INVALIDED FROM SERVICE.				
Recovery.				
Rupture of Left Tympanic Membrane	Wounds { proper sundry	— —	— —	— —
Rupture of Right Tympanic Membrane	Wounds { proper sundry	— —	— —	2 —
Total	Wounds { proper sundry	— —	— —	3 —
RECOVERED IN HOSPITAL.				
Rupture of Left & Right Tympanic Membranes	Wounds { proper sundry	1 —	— —	3 —
Rupture of Left Tympanic Membrane	Wounds { proper sundry	1 —	— —	— —
Rupture of Right Tympanic Membrane	Wounds { proper sundry	— —	— —	4(1) —
Bleeding of Left Tympanic Membrane	Wounds { proper sundry	— —	— —	— —
Hyperaemia of Left Tympanic Membrane	Wounds { proper sundry	— —	— —	— —
Concussion of Left & Right Labyrinths	Wounds { proper sundry	— —	— —	— 1(1)
Concussion of Left Labyrinth.	Wounds { proper sundry	— —	— —	— —
Concussion of Right Labyrinth.....	Wounds { proper sundry	— —	— —	1 —
Rupture of L. & R. Tympanic Membranes & Concussion of L. & R. Labyrinths	Wounds { proper sundry	— —	— —	— —

Sunken Ships.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Army & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
—	—	—	—	—	1	1
—	—	—	—	—	—	—
—	—	—	—	—	—	2
—	—	—	—	—	—	—
—	—	—	—	—	1	4
—	—	—	—	—	—	—
—	3	—	—	—	1	8
—	—	—	—	1(1)	—	1(1)
1	2	—	2(1)	—	5(4)	11(5)
—	—	—	—	—	—	—
1(m)	2	—	5(1)	—	6(1)	18(3)
—	—	—	—	—	—	—
—	1	—	—	—	—	1
—	—	—	—	—	—	—
—	—	—	—	—	1	1
—	—	—	—	—	—	—
—	—	—	1(1)	—	1(1)	2(2)
—	—	1(1)	1(1)	1(1)	—	4(4)
—	—	—	—	—	1(1)	1(1)
—	—	—	—	—	—	—
—	—	—	—	—	—	1
—	—	—	—	—	—	—
—	—	—	—	—	1(1)	1(1)
—	—	—	—	—	—	—

Denomination.		First Attack on Port Arthur.	Block Ships & Flotillas in Escort.	Ships & Vessels in Blockading.
RECOVERED IN HOSPITAL.				
Rupture of L. Tympanic Membrane & Concussion of L. & R. Laby- rinths	Wounds {proper sundry	— —	— —	— —
Rupture of Left Tympanic Membrane & Concussion of Left Labyrinth ...	Wounds {proper sundry	— —	— —	— —
Rupture of Right Tympanic Mem- brane & Concussion of Left Laby- rinth	Wounds {proper sundry	— —	— —	1 —
Otitis Media on Both Sides (concussion of left & right labyrinth?)	Wounds {proper sundry	— —	— —	— —
Total	Wounds {proper sundry	2 —	— —	9(1) 1(1)
RECEIVED TREATMENT ON BOARD THEIR OWN SHIPS.				
Rupture of Left & Right Tympanic Membranes	Wounds {proper sundry	1 —	1(1) —	— 3(3)
Rupture of Left Tympanic Mem- brane	Wounds {proper sundry	— 1	1(1) —	3(1) 6(6)
Rupture of Right Tympanic Mem- brane	Wounds {proper sundry	— —	— —	— 2(2)
Bleeding of Left & Right Tympanic Membranes	Wounds {proper sundry	— —	— —	— —
Bleeding of Right Tympanic Mem- brane	Wounds {proper sundry	— —	— —	— —
Hyperaemia of Left & Right Tympa- nic Membranes	Wounds {proper sundry	— —	1 —	— —
Hyperaemia of Left Tympanic Mem- brane	Wounds {proper sundry	— —	— —	— —
Hyperaemia of Right Tympanic Mem- brane	Wounds {proper sundry	— —	— —	— —

Sunken Ships.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Army & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
—	—	—	1	—	—	1
—	—	—	—	—	—	—
—	—	1	—	—	—	1
—	—	—	—	—	—	—
—	1	—	—	—	—	2
—	—	—	—	—	—	—
1(1)	—	—	—	—	—	1(1)
—	—	—	—	—	—	—
3(1)	9	1	9(3)	—	16(8)	49(13)
—	—	1(1)	1(1)	2(2)	—	5(5)
—	3(1)	—	2	—	—	7(2)
1(1)	1(1)	1(1)	3(3)	—	—	9(9)
—	1(1)	—	5(1)	—	—	10(4)
—	1(1)	4(4)	8(7)	2(1)	—	22(19)
—	1	—	1	—	—	2
—	2(1)	5(5)	7(6)	1	—	17(14)
—	—	—	—	—	—	—
—	—	—	—	1(1)	—	1(1)
—	—	—	—	—	—	—
—	—	—	—	1(1)	—	1(1)
—	1(1)	—	—	—	—	2(1)
1	2(2)	—	—	—	—	3(2)
—	—	—	2	—	—	2
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	1(1)	—	—	1(1)

Denomination.		First Attack on Port Arthur.	Block Ships & Flotillas in Escort.	Ships & Vessels in Blockading.
RECEIVED TREATMENT ON BOARD THEIR OWN SHIPS.				
Rupture of Left Tympanic Mem- brane & Hyperaemia of Right Tympanic Membrane	Wounds {proper sundry	— —	— —	— —
Concussion of Left & Right Labyrinths	Wounds {proper sundry	— —	— —	1(1) m. 2(1)
Concussion of Left Labyrinth ...	Wounds {proper sundry	— —	1 —	1 m. —
Concussion of Right Labyrinth ...	Wounds {proper sundry	— 2(2)	— —	2(2) m. —
Rupture of Left Tympanic Mem- brane & Concussion of Left & Right Labyrinths	Wounds {proper sundry	— —	— —	— —
Rupture of Left Tympanic Mem- brane & Concussion of Right Labyrinth	Wounds {proper sundry	— —	— —	— —
Rupture of Right Tympanic Membrane & Concussion of Right Labyrinth	Wounds {proper sundry	— —	— —	1(1) —
Total.....	Wounds {proper sundry	1 3(2)	4(2) —	8(5) 13(3)
Grand Total	Wounds {proper sundry	3 3(2)	4(2) —	24(7) 15(14)

Remarks.—The figures in parenthesis () show the number of cases wounded only in mechanical mines. Of the invalided, those possessing wounds in the ear which being cured and

Sunken Ships.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Army & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
—	—	—	—	—	—	—
—	—	—	1(1)	—	—	1(1)
—	—	—	3 2)	—	—	4(3)
—	—	—	14(14)	1(1)	1(1)	18(17)
—	—	—	—	—	—	2
—	—	—	5(5)	2 2)	—	7(7)
—	1(1)	—	3(3)	—	—	6(6)
—	—	1(1)	6(6)	2(2)	—	11(2)
—	—	—	—	—	—	—
—	—	1(1)	—	—	—	1(1)
—	—	—	—	—	—	—
—	—	—	2(2)	—	—	2(2)
—	—	—	—	—	—	1(1)
—	—	—	—	—	—	—
—	7(4)	—	16(6)	—	—	36(17)
2(1)	6(5)	12(12)	47(45)	10(8)	1(1)	94(86)
3(1)	19(4)	1	34(10)	—	28(9)	116(33)
2 1)	6(5)	14(14)	51(49)	12(10)	1(1)	104(96)

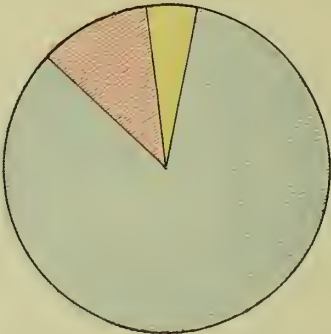
the ear and not attended with any other injury. Those marked (m.) were caused by therefore constitute no cause for invaliding are given as "Recovery of the Invalided."

Wounds of the eye and ear, as given above, being excluded, out of 3,981 wounds, about 230 wounds, or about 5.78 per cent. were injuries done to the viscera. In about 750 cases or 18.84 per cent. of the total, there were fractures combined with the other injuries. The connection between wounds and fractures worked out somewhat as follows: Mutilated and lacerated wounds were almost invariably accompanied by fractures, wounds with loss of soft tissues 50% or less, perforating wounds 3.5% or less, contusions 20% or less, blind wounds 17%, contusion less than 3%, of the respective totals.

If we now calculate the number of days which elapsed between the day on which the wounds were received and the day on which the wounded died, or were invalided or discharged on recovery, the figures run as below: Cases died in hospital average for one person 27.20 days, days' treatment in hospital 9.97. The number of days elapsing before the wounded were invalided was an average for one person, 254.25 days, the days' treatment in hospital being 234.50. Of those who left hospital on recovery, seriously wounded cases gave an average of 111.99 days, with day's treatment in hospital 107.99; while the slightly wounded averaged 48.23 days, with 42.31 days' treatment in hospital. Those treated on board the ships had on an average 11.42 days' treatment, average days' treatment under "light work" being 1.40, under "rest," 1.00 before complete recovery.

Again, comparing the numbers of the killed and wounded in actions (by hostile shells or mines and their indirect projectiles) with the sick and wounded from other causes (January 1, 1904 to December 21, 1905), we get 1 of the former to 18.58 of the latter. To every one day that the former remained under medical treatment out of hospital, there were 73.79 days of the latter; and to every one day that the one remained in hospital, there were 9.63 days of the other. To every one person invalided of the former, there were 7.01 persons invalided of the latter; and to every one of the killed in action, there were only 0.36 that died from the other causes. So that with the single exception of the killed in action, the sick and wounded from other causes were always more numerous than those wounded in action.

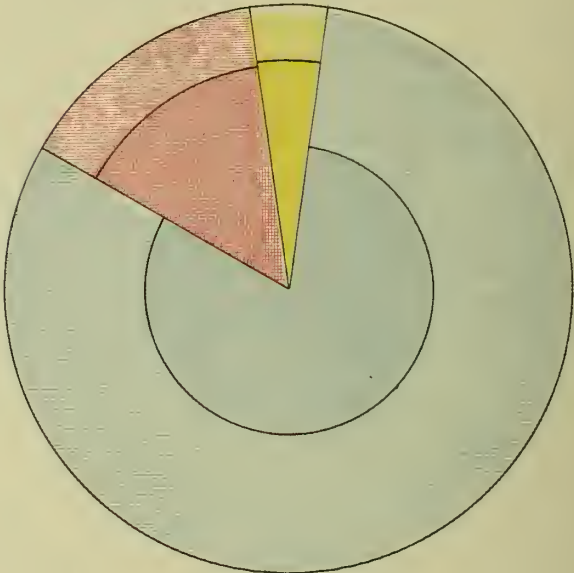
COMPARISON OF THE NUMBER OF CASES OF
DISEASE AND INJURY DURING THE WAR.



Variety.	Number of Cases.	Days' Sickness.	
		In Hospital.	Out Hospital.
Wounded in Action.	3,692	58,263	13,162
Sundries.	17,761	184,054	49,129
Diseases.	50,888	787,158	511,905

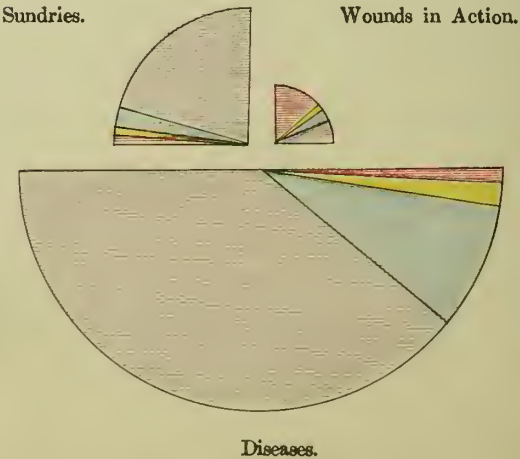
COMPARISON OF DAYS' SICKNESS FOR DISEASE
AND INJURY DURING THE WAR.

(Inner segments show days' sickness in hospital
while outer segments out hospital).



TERMINATION OF CASES OF DISEASE, INJURY AND
WOUND IN ACTION DURING THE WAR.

Variety.	Died.	Invalided.	Recovery	
			In Hospital.	on Board.
Wounded in Action.	2,010	153	486	1,043
Sundries.	437	115	743	10,560
Diseases.	281	957	8,217	37,573



II. The Killed in Action.

Instant Death:—This heading includes not only those who were killed by shells, mechanical mines, shrapnel shells, bullets, etc., or those who were wounded and falling overboard died of their wounds, but also those who went down with their ships, after striking mines, collisions, or stranding. It includes also all the missing whose deaths have not been accounted for otherwise,—indeed, more than one half of the total number of killed and wounded is included in it. The cases of instant death arranged according to their causes, were 1,175 killed and drowned through mechanical mines, 260 by shells, 2 by shrapnel shells, 4 by bullets, 2 by fish-torpedoes, and 1 by the explosion of gun-cotton, besides 439 who were drowned after collisions, or otherwise missing. Of all these dead, there were only 253, whose wounds we could examine so as to ascertain the causes of their death; the remaining, 1,630, were roughly discriminated into “Wounded and drowned,” “Drowned,” “Wounded and killed,” but the exact details of their deaths remain unknown. Below will be found the statistics of instant deaths arranged according to the location of the wounds inflicted in different battles (of mortal wounds, any one of which alone might have been the cause of death, the most serious one in each case has been taken, and this applies also to the cases of those who died of their wounds in hospitals).

CASES OF INSTANT DEATH ARRANGED ACCORDING TO THE LOCATION OF INJURIES AND THE BATTLES FOUGHT.

Location of Wounds.	First Attack on Port Arthur.	Block ships & Flotillas in Escort.	Ships & Vessels in Blockading.	Destroyers & Torpedo Boat Flotillas in Blockading.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Land Operations & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
CASES KNOWN.											
Injuries extending over the Whole Body.....	—	—	—	22	—	21	2	20	—	7	72
Injuries of the Head.....	1	2	15	5	—	7	7	19	1	5	62
Injuries of the Face.....	—	—	—	1	—	—	4	4	—	1	10

Location of Wounds.	First Attack on Port Arthur.	Block Ships & Flotillas in Escort.	Ships & Vessels in Blockading.	Destroyers & Torpedo Boat Flotillas in Blockading.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Land Operations & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
CASES KNOWN.											
Injuries of the Head & Face...	—	—	2	—	—	1	—	3	—	8	14
Injuries of the Neck.....	—	—	2	—	—	—	1	1	—	2	6
Injuries of the Chest.....	—	4	8	4	—	6	3	8	1	3	37
Injuries of the Abdomen.....	1	—	1	4	—	3	4	7	—	2	22
Injuries both of the Chest & Abdomen	1	1	1	4	—	3	1	5	—	5	21
Injuries of the Extremities.....	—	—	3	—	—	1	—	4	—	1	9
Total.....	3	7	32	40	—	42	22	71	2	34	253
CASES UNKNOWN.											
Wounded & Drowned.....	—	75	15	68	1,069	10	14	15	1	—	1,267
Wounded & Killed	—	1	—	—	—	—	—	—	—	—	1
Drowned	—	—	1	39	319	—	—	2	—	—	361
Suffocated	—	—	1	—	—	—	—	—	—	—	1
Total.....	—	76	17	107	1,388	10	14	17	1	—	1,630
Grand Total.....	3	83	49	147	1,388	52	36	88	3	34	1,883

Remarks:—Injuries extending over the whole body given above include twenty-three cases of whole body mutilated, twenty cases of whole body scalded, two cases of whole body scalded besides other wounds, six cases of whole body burned and otherwise wounded, and the remaining twenty-one cases had numerous mortal wounds on the body and were so badly disfigured as to make them hardly distinguishable from cases with the whole body mutilated. Of the killed from wounds in the head, face, and trunk, those caused by mechanical mines and secondary explosions of ammunition, some were slightly, and some seriously, wounded in several parts of the body; but only the mortal wounds are here given. Those who died of wounds chiefly in the limbs were three cases of left and right thighs blown off, one case of left thigh blown off, right thigh extensively deprived of soft tissues and compound fracture of right leg, one case of compound fracture of left femur and right leg, one case of right upper arm blown off and wounds with loss of soft tissues in the chest and buttock, one case of compound fractures of the left and right femurs and the right ilium with both feet blown off from ankle-joints, one case of perforating wound of the knee with profuse bleeding and one case of compound fracture of the right scapula attended with profuse bleeding.

Deaths after Wounds.—Of cases severely wounded in action and not killed on the spot but taken to the dressing stations where they received dressing once at least before death, or which lived for some hours and had their limbs amputated, or which were rescued from drowning in a state of asphyxia, and who could not be restored to life, being frozen and exhausted, there were 92 in all throughout the war, of which 87 were killed by shells, 1 by mechanical mine, 2 by shrapnel shells; whilst 2 from scalds by steam from a broken steam-pipe. They are as shown below :—

**CASES OF DEATHS LATER FROM WOUNDS ARRANGED ACCORDING
TO LOCATION OF INJURIES AND BATTLES FOUGHT.**

Location of Injuries.	First Attack on Port Arthur.	Block Ships & Flotillas in Escort.	Ships & Vessels in Blockading.	Torpedo Boats & Destroyers.	Sunken Ships.	Battle of Yel- low Sea.	Battle of Ul- san.	Battle of Japan Sea.	Co-operation with Land Operations & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
Injuries extending over the Whole Body	—	—	2	1	—	—	—	3	—	—	6
Injuries of the Head	—	—	1	—	—	5	3	2	1	2	14
Injuries of the Face	—	—	—	—	—	—	1	1	—	4	6
Injuries of the Breast.....	—	—	1	2	—	2	—	2	—	2	9
Injuries of the Abdomen	1	1	—	—	—	2	3	1	—	3	11
Injuries of Chest & Abdomen	—	—	—	—	—	1	—	1	—	3	5
Injuries of the Extremities ...	1	1	—	6	—	8	1	12	—	2	31
Frozen to Death.....	—	—	—	—	10	—	—	—	—	—	10
Total.....	2	2	4	9	10	18	8	22	1	16	92

Remarks;—Under “Injuries extending over the whole body” are included four cases of whole body scalded, one case of extensive burns, and one case of scalds in the head, both forearms, buttocks and both lower limbs. The wounds in the head, chest and abdomen were mostly perforating and penetrating wounds with fractures, the viscera being always injured. The wounded of the extremities include one case of right upper arm blown off, one case of right scapula and upper arm wholly mutilated, two cases of both thighs blown off, two cases of one thigh blown off, one case of one thigh blown off and a serious wound on

the other leg, three cases (of which one died of hæmorrhage) of compound fracture of the femur, two cases of both the lower legs blown off, three cases of one leg blown off, three cases of one leg blown off with serious wounds on the other leg, one case of compound fracture of pelvis and femur, seven cases of blind or perforating wounds, as well as cases attended with loss of soft tissues and fractures in several parts of lower limbs, one case of thigh and forearm blown off, one case of an upper arm, and a leg wholly crushed and mutilated, one case of forearm blown off with compound fracture of a femur, and two cases of compound fracture of a humerus with serious wounds on the thigh and on the soft part of the foot.

III. Wounded Patients in Hospital.

Died after Admission into Hospital or Hospital Ships:—The deaths in this class numbered only 35 throughout the war. Of these, 7 were men of the Naval Heavy Gun Brigade engaged in the investing attack upon Port Arthur, who died in our Army Field Hospitals and in Army Stationary Hospitals; 1 was transferred through an Army Hospital Ship, to the Hiroshima Reserve Hospital, where he died of tetanus, 2 died at the Takeshiki Sick Quarters, 12 died on the Naval Hospital Ships, 13 died at the Sasebo Naval Hospital.

Those that died soon after admission into the Army Field Hospital, Naval Hospital Ships and Takeshiki Sick Quarters were all of them much the same in the general condition of their wounds as those described in the preceding article, paragraph 2. Of those that died after admission into the Sasebo Naval Hospital, in the case of 4 that died five days after admission, their wounds may be considered as the immediate causes of death. Three that died within two weeks, 2 that died within three weeks, and 3 that died within eight weeks suffered from wound suppuration, and may be said to have died of complications, whilst one that died after the lapse of a year and a half had a wound on the head which to all appearance healed once. The man was discharged, but afterwards entered again in consequence of encephalomalacia, of which he died.

Of the "died in hospital" 27 cases were due to shell-wounds, 7 to wounds from mechanical mines, 1 to a fracture of the base of the skull, caused by falling from a height.

Of the wounded by mines all—except one civilian employé who was burned by the outburst of flame at the time of the sinking of the *Hatsuse* and died soon

after admission into the Sasebo Naval Hospital,—died within a short while after being taken on board a hospital ship.

**DEATHS IN HOSPITALS ARRANGED ACCORDING TO LOCATION
OF INJURIES AND BATTLES FOUGHT.**

Location of Wounds	First Attack on Port Arthur	Block Ships & Flotillas in Es- cort.	Ships & Vessels in Blockading.	Destroyers & Tor- pedo Boats in Blockading.	Sunken Ships & Destroyers.	Battle of Yel- low Sea.	Battle of Ul- san.	Battle of Japan Sea.	Co-operation with Land Operations & Northern Squadron	Naval Heavy Gun Brigade.	Total.
Injuries of the Extensive Part of the Body	—	—	—	2	1	—	1	—	—	—	4
Injuries of the Head	—	—	2*	—	—	—	1	—	—	—	3*
Injuries of the Face.....	—	—	1	—	—	—	—	—	—	—	1
Injuries of the Neck	1	—	1	—	—	—	—	—	—	—	2
Injuries of the Chest	—	—	1	—	—	1	1	1	—	2	6
Injuries of the Abdomen	—	—	1	1	—	—	—	1	—	1	4
Injuries of the Chest & Abdo- men	—	—	—	—	—	—	—	1	—	1	2
Injuries of the Extremities ...	3	—	—	—	—	—	4	—	—	6	13
Total.....	4	—	6*	3	1	1	7	3	—	10	35*

*One being a case of “wounded in discharge of duty, with no direct relation to any hostile weapons.”

Remarks:— The “Injuries of the extensive part of the body” include three cases of scalds, and one case of innumerable abrasions all over the body with death from intraperitoneal bleeding. The “Injuries in the head, face and neck” comprise one case of death from shell-wound in the left temple followed by the softening of the brain after the wound was healed, two cases of fracture of the base of the skull, one case of compound fractures of upper and lower jaws and right arm, one case of a shell-wound which broke the cervical vertebra and produced suppurative spinal meningitis, and one case of compound fractures of the cervical vertebrae and clavicle. The “Injuries of the chest” include two cases of compound fracture of the scapula with the complications of pyaemia, three cases of penetrating wounds of the thoracic cavity, one case of perforating wound of the same. The “Injuries of the abdomen” comprise one case of penetrating wound, one case of compound fracture of the pelvis followed by peritonitis, two cases of death from peritonitis without any marked wound in the abdominal wall.

“Wounds of the chest and abdomen” comprise one case of penetrating wound of the thoracic and abdominal cavities, and one case of simple fracture of ribs accompanied by peritonitis. The “wounds of the upper and lower extremities” include one case of compound fracture of humerus of one side with wounds on the other arm, one case of the

thigh blown off, one case of compound fracture of the leg on one side and compound fracture of the face, with extensive loss of soft tissues on the other side of the thigh, two cases of wounds on the thigh or in popliteal region accompanied by gangrene of the leg, one case of compound fracture with blind wound of the thigh with accompanying pyaemia, one case of compound fracture of the knee-joint on one side with compound fracture of the leg on the other, one case of one leg blown off, one case of compound fracture of the leg, one case of compound fracture of the leg on one side with wounds on the thigh on the other, one case of contusion on the left thigh with compound fracture of the right foot and accompanying tetanus, one case of compound fracture of the scapula with extensive loss of soft tissues and compound fracture of the femur, one case of the right arm blown off with compound fracture of the leg.

Invalided :—The petty officers and men invalided on account of impaired functions from injuries received in battle numbered fifty-one in the battle of the Japan Sea, thirty-three in the Naval Heavy Gun Brigade, twenty-seven in the ships and vessels on blockading service, twenty-two in the battle of the Yellow Sea, seven in the battle of Ulsan, five in the first attack on Port Arthur, three each among the crews of the block ships and of the sunken ships and destroyers, two in the Northern Squadron,—making altogether 153, which is a little less than $1/24$ of the total casualties in killed and wounded, and about $1/13$ of the same, exclusive of the dead whose bodies could not be found, the whole being less than $1/4$ of the cases admitted into hospitals.

The invalided, when classed according to the causes of injuries received, are 126 by shells, eight by mechanical mines, five by shrapnel shells, two by bullets, and two by the explosion of gun cotton, besides 10 others.

The same, classified for invaliding, are three for cicatricial contraction as the result of burns and for simultaneous injury to the ears, which resulted in “high degree” of impairment of hearing, one for cicatrices left by burns with ankylosis of hands and fingers in consequence of the fracture, two for impaired functions of sight, hearing and mastication with stiff joints in consequence of wounds in several parts of the face, and extremities. Two for impaired mental function from wounds on the head, one for hemianopsia and one for extensive loss of bone in the cranium, thirty-four for impairment of sight, hearing, mastication and articulation, due to cicatricial contraction from wounds of the face and ears, four for results of penetrating wounds in the chest and abdominal cavity, cicatrices being formed on the chest and abdominal wall, forty-four for amputation of wounded limbs, stiff joints, etc., and 61 for results due to wounds on lower limbs. Their wounds, together with the reasons assigned for invaliding, will be seen from the following table :—

INVALIDED (FROM SERVICE) CLASSIFIED AS TO INJURIES
AND BATTLES FOUGHT.

Injuries.	Reasons for In- validating.	First Attack on Port Arthur.	Block Ships & Escorting Flotilla.	Ships & Vessels in Blockading.	Destroyers & Tor- pedo Boats in Blockading.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Land Forces & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
INJURIES IN SEVER- AL PARTS OF THE BODY.												
Burns in the External Auditory Meatus & several other Parts of the Body.	Cicatricial contrac- tion & impaired hearing.....	—	—	—	—	—	—	—	3	—	—	3
Burns in several Parts of the Body with Simple Fractures of Fingers.	Cicatricial contrac- tion & ankylosis of fingers.....	—	—	—	—	1	—	—	—	—	—	1
Compound Fracture of the Upper & Lower Jaws & Humerus, Forearm blown off, Extensive Loss of Soft Tissues of the Left Thigh.	Mastication impair- ed, upper arm am- putated, ankylosis of elbow-joint & cicatricial contrac- tion on the right thigh	—	—	—	—	—	—	—	1	—	—	1
Compound Fractures of the Right Humerus & Femur, Contused Wound of the Left Eye & Ruptures of both Tympanic Membra- nes.	Loss of sight in one eye, impaired hearing, ankylosis of elbow-joint & thigh amputated...	—	—	—	—	—	—	—	—	—	1	1
Total.....	.....	—	—	—	—	1	—	—	4	—	1	6
INJURIES OF THE HEAD.												
Penetrating Wound of the Skull by Shrapnel Shells.	Hemianopsia.....	—	—	—	—	—	—	—	—	—	1	1
Contusion on the Fore- head, Blind Wound in the Thoracic Wall.	Mental derange- ment.	—	—	—	—	—	—	—	—	—	1	1
Compound Fractures of the Skull & Left Femur.	Extensive defect of bone in the skull...	—	—	—	—	—	—	—	—	—	1	1
Compound Fracture of the Skull & Sprain of the Left Ankle-Joint.	Mental derange- ment & impaired gait	—	—	1	—	—	—	—	—	—	—	1
Total.....	.....	—	—	1	—	—	—	—	—	—	3	4

Injuries.	Reasons for Invaliding.	First Attack on Port Arthur.	Block Ships & Escorting Flotilla.	Ships & Vessels in Blockading.	Destroyers & Torpedo Boats in Blockading.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with the Forces of the Northern Squadron.	Naval Heavy Gun Brigade.	Total.
INJURIES OF THE FACE.												
Contusions & Contused Wounds of the Eye.	Eye-sight impaired or lost.....	1	—	—	1	—	1	—	3	—	1	7
Ruptures of Tympanic Membrane, Concussion of Labyrinth.	Impaired hearing...	—	—	3	—	—	2	1	8	—	5	19
Explosion wound & Contusion of the Eye with Ruptures of Tympanic Membrane.	Both eye-sight & hearing impaired.	—	—	—	—	—	1	—	—	—	1	2
Concussion of the Labyrinth with Traumatic Hysteria.	Impaired hearing & hysteria	—	—	—	—	—	—	—	—	—	1	1
Compound Fracture of the Lower Jaw.	Mastication impaired	—	—	1	—	—	—	—	—	—	—	1
Contusion of the Eye, Rupture of both Tympanic Membranes, Compound Fracture of the Tibia.	Eye-sight & hearing impaired with motor disturbance of the leg.....	—	—	—	—	—	—	—	—	—	1	1
Compound Fracture of the Lower Jaw.	Mastication & Articulation impaired.	—	—	—	1	—	—	—	—	—	—	1
Compound Fracture of the Upper & Lower Jaw.	Mastication & articulation impaired, deformities in the face.	—	—	—	1	—	—	—	—	—	—	1
Contused Wound of the Face & Left Eye & Fracture of the Lower Jaw.	Eye-sight lost in one eye, mastication & articulation impaired	—	—	—	—	—	1	—	—	—	—	1
Total.....		1	—	4	3	—	5	1	11	—	9	34
INJURIES OF THE UPPER EXTREMITY.												
Simple & Compound Fracture of the Clavicle, Compound Fracture of the Scapula, Blind Wound in Scapular Region.	Impaired function of the shoulder-joint	1	—	—	—	—	—	—	—	—	3	4
Perforating Wound of Upper Arm with Fracture of the Humerus.	The whole upper extremity amputated	—	—	—	1	—	—	—	—	—	1	2
Compound Fracture of the Humerus with Extensive Loss of Soft Tissues of the Upper Arm, Contused Wound of the Elbow, Compound Fracture of the Humerus, Radius &	Amputation at upper arm	1	1	1	1	—	—	—	2	—	1	7

Injuries.	Reasons for Invaliding.	First Attack on Port Arthur.	Block Ships & Escorting Flotilla.	Ships & Vessels in Blockading.	Destroyers & Torpedo Boats in Blockading.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Land Forces & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
Perforating Wound of the Forearm with Fracture, Rupture of Tympanic Membranes by Shrapnel Shells.	Forearm shortened & hearing impaired	—	—	—	—	—	—	—	—	—	1	1
Blind Wound of the Forearm & Compound Fracture of the Skull.	Motor disturbance of the forearm with headache	—	—	—	—	—	—	—	—	—	1	1
Blind Wound of the Forearm with Fracture.	Motor disturbance of the forearm.....	—	—	—	1	—	—	—	—	—	—	1
Simple Fracture of the Radius & Ulna, Blind Wound of the Hand with Fracture.	Motor disturbance of the wrist-joint.	—	—	—	2	—	—	—	—	—	—	2
Extensive Loss of Soft Tissues of the Forearm, Perforating Wound of the Hand with Fractures of Metacarpal Bones.	Motor disturbances of hand & fingers	—	—	—	—	—	—	—	3	1	—	4
Hands & Fingers mutilated or Compound Fracture.	Hands lost or ankylosis of joints of the hands & fingers ...	—	—	—	—	2	—	—	—	—	2	4
Total		2	2	1	8	2	2	1	16	1	9	44
INJURIES OF THE LOWER EXTREMITY.												
Contused Wounds of the Sacral & Gluteal Regions.	Motor disturbance of the lower limbs.	—	—	—	—	—	—	—	1	—	—	1
Compound Fracture of the Ilium & Extensive Loss of Soft Tissues of the Thigh.	Cicatrices on the sacral & gluteal regions	—	—	—	—	—	1	—	—	—	—	1
Mutilation, Perforating Wound of the Thigh with Fracture of the Femur, Penetrating Wound of the Knee-Joint with Fracture, Leg blown off.	The lower extremity amputated at the thigh	—	—	—	—	—	2	—	3	—	2	7
The Thigh blown off.	Loss of the lower limb.	—	—	—	—	—	—	—	1	—	—	1
Blind Wound of the Thigh with Fracture.	Disturbance of sensibility & movement of the limb.	—	—	—	—	—	1	—	—	—	—	1

Perforating Wound of the Thigh with Fracture of the Femur, Blind Wound with the Same, Simple Fracture of the Femur.	The thigh shortened	—	—	1	—	—	1	2	—	—	—	4
Compound Fracture of the Right Femur & Left Knee-Joint.	Shortening of the thigh & ankylosis of the knee-joint	—	—	—	—	—	—	1	—	—	—	1
Wounds with Extensive Loss of Soft Tissues of the Thigh with Fracture.	Cicatricial contraction & shortening of the thigh.....	—	—	—	—	—	1	—	—	—	—	1
Blind Wound of the Thigh with Fracture, Extensive Loss of Soft Tissues of the Same, Simple Fracture of the Femur, Compound Fracture of the Knee-Joint.	Ankylosis of the knee-joint	—	—	1	—	—	2	—	1	—	—	4
Simple Fracture of the Femur.	Shortening of the thigh & ankylosis of knee-joint.	—	—	—	1	—	—	—	—	—	—	1
Mutilation of the Knee-Joint.	Loss of the leg.....	—	—	—	—	—	—	—	1	—	—	1
Compound Fracture of the Leg.	Amputated at the knee-joint	—	1	—	—	—	—	—	—	—	—	1
Compound Fracture of the Left Knee-Joint & Right Ankle-Joint.	Ankylosis of the joints.....	—	—	—	1	—	—	—	—	—	—	1
Compound Fracture of the Right Knee & Left Elbow-Joints.	Ankylosis	—	—	—	—	—	—	—	1	—	—	1
Compound Fracture of the Knee-Joint & Right Index Finger.	Ankylosis & shortening of the finger	—	—	—	—	—	—	—	—	—	1	1
Mutilation of the Leg.	The left leg lost	—	—	—	1	—	1	1	2	—	—	5
Mutilation & Compound Fracture of the Leg, Mutilation, Laceration & Contused Wounds of Foot.	Legs amputated.....	1	—	—	—	—	3	—	—	—	4	8
Compound Fracture of the Left Leg & the Right First Metatarsal Bone.	Leg amputated	—	—	—	1	—	—	—	—	—	—	1
Contused Wound of the Face with Fractures of the Upper & Lower Jaw, & Compound Fracture of Metatarsal Bones.	Leg amputated & mastication impaired	—	—	—	—	—	—	—	—	—	1	1
Wounds with Extensive Loss of Soft Tissues of the Leg, Simple Fracture, Compound Fracture of Bones of the Leg.	Impairment of gait	—	—	—	1	—	—	—	2	—	—	3

Injuries.	Reasons for Invaliding.	First Attack on Port Arthur.	Block Ships & Escorting Flotilla.	Ships & Vessels in Blockading.	Destroyers & Torpedo Boats in Blockading.	Sunken Ships & Destroyers.	Battle of Yellow Sea.	Battle of Ulsan.	Battle of Japan Sea.	Co-operation with Land Forces & Northern Squadron.	Naval Heavy Gun Brigade.	Total.
Compound Fracture of the fifth Metatarsal Bone & Rupture of both Tympanic Membranes.	Movement of the leg & hearing impaired	—	—	1	—	—	—	—	—	—	—	1
Right Leg mutilated.	Amputated at the ankle	—	—	—	—	—	1	—	—	—	—	1
Compound Fractures of the Leg & Ankle-Joint.	Ankylosis	—	—	—	—	—	1	—	1	—	—	2
Compound Fracture of the Ankle-Joint.	Ankylosis & shortening of the leg	—	—	—	—	—	—	—	1	—	—	1
Compound Fractures & Contused Wounds of the Foot.	Impaired walking...	—	—	—	1	—	1	—	5	1	2	10
Contused Wound of the Foot with Rupture of Tympanic Membrane.	Walking & hearing impaired	—	—	—	—	—	—	—	—	—	1	1
Total .....	.....	1	1	3	6	—	15	4	19	1	11	61
INJURIES OF THE TRUNK.												
Penetrating Wound of the Thoracic Cavity.	Stenosis of the thorax & cicatrices from X-ray	1	—	—	—	—	—	—	—	—	—	1
Penetrating Wound of the Abdominal Cavity.	Cicatricial contraction	—	—	—	—	—	—	—	1	—	—	1
Compound Fracture of the Ribs & Femur.	Cicatrices on the chest & shortening of the lower extremity.	—	—	—	—	—	—	1	—	—	—	1
Wounds with Extensive Loss of Soft Tissues of the Lumbar & Abdominal Regions, with Left Hand & Arm lacerated.	Cicatrices on the abdomen & arm amputated	—	—	1	—	—	—	—	—	—	—	1
Total .....	.....	1	—	1	—	—	—	1	1	—	—	4
Grand Total .....	.....	5	3	10	17	3	22	7	51	2	33	153

Recovered in Hospital :— The wounded in engagement or in operation before the enemy who were treated in hospitals and after recovery resumed their service numbered altogether 486, of whom 308, were wounded by shells, ninety-five by mechanical mines, fourteen by shrapnel shells, three by bullets, six by fish-torpedoes, four by gun-cotton explosion ; and the remaining fifty-six from causes other than the hostile weapons as stated above. These are distinguished into the seriously, and the slightly, wounded. Among the seriously wounded are cases of injuries to the bones, joints and viscera, or of extensive contused wounds, the loss of soft tissues, etc., many of whom recovered after a long treatment at hospitals. These numbered 119 in all, of whom 113 were wounded by shells, mines, etc., while the remaining six got their wounds from sundry causes. When classed according to the locality of their wounds, we find fifty-three in the lower limbs, twenty-four in the upper limbs, sixteen in the chest and back, fourteen in the face (seven of which in the eye), twelve in the extensive part of the body, six in the head, and three each in the neck and loins, with none in the abdomen. By the term “slightly wounded” we mean cases wounded in the soft parts with no injury to any important part of the body and which recovered after treatment on hospital ships or in naval hospitals. The total number of wounds in this class is 842, being at the rate of 2.29 for one wounded person.

Below find tables showing the wounds and injuries, serious as well as slight, of those who left hospital on recovery :—

RECOVERED AT HOSPITAL.

Lumbar Region.	Scapular Region.	Clavicular Region.	Upper Arm.	Elbow.	Forearm.	Wrist.	Hand.	Finger.	Inguinal Region.	Gluteal Region.	Thigh.	Knee & Popliteal Region.	Leg.	Heel.	Sole.	Total
																2
			1													1
					1				1	1	2					8
											1(1)					1(1)
																1
	1															1
		1														1
2																2
					1											1
						1										1
																1
													1			1
													2			2
														1		1
																1
																1
					1											1
			3	1	2				1	1	4	1	1	1		17
																1
	1					1					1		1			5
											1					1
																1
																1
								1								1
																1
																1
					1						9		3			13

Wounds.	Extensive Parts of the Body.	Head.	Eye.	Face.	Neck.	Thoracic Wall.	Thoracic Cavity.	Back.	Abdomen.
Explosion-Wound	1	—	—	—	—	—	—	—	—
Burns	6	—	—	—	—	—	—	—	—
Scalds	5(3)	—	—	—	—	—	—	—	—
Displacements in Fracture	—	—	—	—	—	—	—	—	—
Total	12(3)	6	7(2)	7	3	7	3	6	—

Remarks:—Figures in parenthesis indicate those wounds sustained from causes other tables also.

SLIGHT WOUNDS TREATED AND

Wounds.	Trunk & Limbs.	Head.	Ear.	Face.	Eye.	Neck.	Chest.	Back.
Perforating Wound of Soft Part	—	—	—	1	—	—	1	—
Perforating Wound of Soft Part by Shrapnel Shell	—	—	—	1	—	—	—	—
Perforating Wound of Soft Part by Bullet	—	—	—	—	—	—	—	—
Blind Wound with Fracture.....	—	—	—	—	—	—	—	—
Blind Wound of Soft Part.....	—	7	—	5	—	2	4	5
Blind Wound of Soft Part by Shrapnel Shell	—	—	—	—	—	—	1	—
Mutilated Wound.....	—	—	—	—	—	—	—	—
Contused Wound with Fracture	—	—	—	—	—	—	—	—
Contused Wound with Incomplete Fracture	—	—	—	—	—	—	—	—
Contused Wound	—	44	—	47(5)	—	—	6	—
Contusion with Fracture.....	—	—	—	—	—	—	—	—
Contusion with Dislocation	—	—	—	—	—	—	1	—
Contusion	—	8(2)	—	15(1)	—	2	17(4)	5

Lumbar Region.	Scapular Region.	Clavicular Region.	Upper Arm.	Elbow.	Forearm.	Wrist.	Hand.	Finger.	Inguinal Region.	Gluteal Region.	Thigh.	Knee & Popliteal Region.	Leg.	Heel.	Sole.	Total.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	53)
—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
3	2	2	7	1	8	1	1	2	2	5	20(1)	4(1)	18	3	1(1)	131(8)

than hostile weapons and their indirect projectiles. The same applies to the following two

RECOVERED IN HOSPITALS.

Abdomen.	Lumbar Region.	Perineal Region.	Scapular Region.	Upper Arm.	Forearm.	Hand.	Finger.	Gluteal Region.	Thigh.	Leg.	Foot.	Toe.	Total.
—	—	—	1	1	1	2	—	—	6	3	1	—	17
—	—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	—	—	—	—	—	1(1)	—	1	—	—	—	2 1)
—	—	—	—	—	—	—	2	—	—	—	—	—	2
1	4	—	5	15	5	1	—	2	15	22	5	—	98
—	—	—	—	—	—	—	—	—	1	—	—	—	2
—	—	—	—	—	—	—	4(1)	—	—	—	—	1	5(1)
—	—	—	—	—	—	—	8(4)	—	—	—	—	1	9(4)
—	—	—	—	—	—	1	—	—	—	—	—	—	1
—	4(1)	1	4	12	13	8(1)	15(5)	3	17(1)	23(1)	7(1)	4(1)	208(16)
—	—	—	—	—	—	—	—	—	—	—	1(1)	1(1)	22)
—	—	—	—	—	—	—	—	—	—	—	—	—	1
1	11(2)	—	11(3)	11(2)	3	2	1(1)	4(1)	30(4)	14(1)	16(5)	—	151(26)

Wounds.	Trunk & Limbs.	Head.	Ear.	Face.	Eye.	Neck.	Chest.	Back.
Lacerated & Mutilated Wound.....	—	—	—	—	—	—	—	—
Lacerated Wound.....	—	3	—	3	—	—	—	—
Abrased Wound	—	4	—	8	—	1	2	1
Abrasion.....	1	2	—	10	—	2	3(1)	2
Explosion Wound.....	—	2	—	16	—	3	1	3
Burns	—	4	—	21	—	2	1	—
Scalds	—	—	—	5	—	—	—	—
Punctured Wound	—	—	—	—	—	—	—	—
Sprain.....	—	—	—	—	—	—	—	—
Incisors of the Upper Jaw broken	—	—	—	1(1)	—	—	—	—
Penetration of Foreign Bodies into both Eyes	—	—	—	—	4	—	—	—
Penetration of Foreign Body into one Eye.....	—	—	—	—	3	—	—	—
Burns of the Cornea	—	—	—	—	2	—	—	—
Total.....	1	74(2)	—	133(7)	9	12	37(5)	16

Remarks:— The figures in parenthesis show the numbers of wounds incurred from causes other than the direct or indirect influences of hostile weapons.

Abdomen.	Lumbar Region.	Perineal Region.	Scapular Region.	Upper Arm.	Forearm.	Hand.	Finger.	Gluteal Region.	Thigh.	Leg.	Foot.	Toe.	Total.
—	—	—	—	—	—	—	—	—	—	—	1	—	1
—	—	1	—	—	—	—	—	—	—	—	—	—	7
1	—	—	3	5	2	3(2)	1	1	4(1)	5(2)	—	—	41(5)
1	4(1)	—	4	10	8(1)	2	8(1)	3	16(1)	14(3)	1	1	92(8)
—	2	—	—	5	5	1	2	—	—	1	—	—	41
—	—	—	—	—	12	12	5	—	2	3(1)	2	—	64(1)
—	—	—	1	—	3	5	—	—	—	—	—	—	14
—	—	—	—	—	—	—	—	—	—	2	—	—	2
—	—	—	—	—	1	—	—	—	—	3(3)	2	—	6(3)
—	—	—	—	—	—	—	—	—	—	—	—	—	1(1)
—	—	—	—	—	—	—	—	—	—	—	—	—	4
—	—	—	—	—	—	—	—	—	—	—	—	—	3
—	—	—	—	—	—	—	—	—	—	—	—	—	2
4	25(4)	2	29(3)	59(2)	53(1)	37(3)	47(13)	13(1)	92(7)	90(11)	36(7)	8(2)	777(68)

IV. Wounds treated on Board Ship.

Cases slightly wounded in action which received treatment on their own ships and got their wounds cured, are included under this heading. With them are, also reckoned men wounded on ships and vessels carrying no medical officer or wounded at the time of the sinking of their ships, who had their wounds treated on the warships and destroyers near by. Of such there were 1,043 cases in all, of which 538 were due to shells, 140 to mechanical mines, 21 to shrapnel shells, bullets, fish-torpedoes, gun cotton and close combat, while the rest, numbering 344, were due to causes other than hostile weapons. The total number of wounds is 1,334, being at the average of 1.28 for each wounded person.

Below find their wounds tabulated:—

WOUNDS TREATED

Wounds.	Head.	Ear.	Face.	Eye.	Neck.	Chest.	Back.
Perforating Wound	1	—	2	—	—	—	—
Lower Lip perforated & Left First Premolar of the Lower Jaw broken	—	—	1	—	—	—	—
Blind Wound.....	2	—	7	—	1	1	—
Blind Bullet-Wound	—	—	—	—	—	—	—
Contused Wound with Fracture.....	—	—	—	—	—	—	—
Contused Wound	65(13)	—	61(16)	—	3	10(1)	2
Simple Fracture.....	—	—	—	—	—	—	—
Contusion of Eye Ball	—	—	—	3	—	—	—
Contusion.....	12(2)	—	33(4)	—	6(1)	33(5)	7(1)
Lacerated Wound	1	—	—	—	—	—	—
Abrased Wound	9	—	14	—	3	6(1)	2
Abrased Wound by Shrapnel Shell	—	—	—	—	1	—	—
Abrased Wound by Bullet	1	—	—	—	—	—	—
Abrasion	9	—	22(1)	—	5(1)	3	6(2)
Incised Wound	1(1)	—	3(2)	—	—	—	—
Punctured Wound.....	1	—	2(1)	—	—	—	—
Burns	5	—	12(5)	—	2(1)	1	—
Scalds	—	—	4	—	—	—	—
Explosion-Wound	6	—	21	—	2	3	1
Sprain	—	—	—	—	—	—	—
Incisors broken	—	—	3(1)	—	—	—	—
Haematoma	1	—	—	—	—	—	—
Penetration of Foreign Bodies into Both Eyes...	—	—	—	3	—	—	—
Penetration of Foreign Body into One Eye	—	—	—	8(1)	—	—	—
Total.....	114(16)	—	185(30)	14(1)	23(3)	57(7)	18(3)

ON BOARD.

Abdomen.	Lumbar Region.	Scapular Region.	Upper Arm.	Forearm.	Hand.	Finger.	Gluteal Region.	Thigh.	Leg.	Foot.	Toe.	Total.
—	—	—	—	—	1	—	—	—	1	—	—	5
—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	1	1	2(1)	2	—	1	5	2	1	1	27(1)
—	—	1	—	—	—	—	—	—	—	2	—	3
—	—	—	—	—	—	1(1)	—	—	—	—	—	1(1)
—	1	9	15	18(2)	18(1)	59(23)	5	37(5)	39(4)	10(4)	18(12)	370(86)
—	—	—	—	—	—	1	—	—	—	—	—	1
—	—	—	—	—	—	—	—	—	—	—	—	3
8(2)	19(3)	13(4)	19(8)	28(6)	14(8)	28(13)	15(3)	83(28)	46(15)	22(11)	16(13)	402(127)
—	—	—	—	—	1	—	—	1	—	—	—	3
—	2	1	3(1)	9(2)	1	8(4)	1	6	9(1)	2	1	77(9)
—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	—	2	—	—	—	1	—	—	—	—	4
—	2	7(2)	5(1)	13(4)	4(1)	12(5)	4(2)	9(3)	21(5)	5(3)	—	127(30)
—	—	—	—	—	4(2)	7(6)	—	—	—	3(3)	1(1)	19(15)
—	—	—	—	—	1	—	—	—	2(1)	3	—	9(2)
—	—	—	7(3)	10(3)	6(2)	9(7)	1	3(1)	7(1)	1(1)	—	64(24)
—	—	—	1(1)	—	7	—	—	—	2(2)	1(1)	—	15(4)
1	—	1	2	2	3	—	—	4	2	1	—	49
—	—	—	—	—	—	4(3)	—	—	—	6(6)	—	10(9)
—	—	—	—	—	—	—	—	—	—	—	—	3(1)
—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	—	—	—	—	—	—	—	—	—	—	3
—	—	—	—	—	—	—	—	—	—	—	—	8(1)
9(2)	24(3)	33(6)	55(14)	82(18)	62(14)	129(67)	28(5)	148(37)	131(29)	57(29)	37(26)	1,206(310)

SECTION IV. WOUNDS OF PRISONERS.

The Russians, naval and civilian, who were made prisoners by our Navy were altogether 16,213 in number, of whom (excluding 1,113 who were released or who died at the front) 15,100 were taken to Japan. This number was afterwards diminished by 106, released, died, or escaped; the remaining 14,994 inclusive of officers and men were the number in Japan at the time of the restoration of peace.

The first men of the Russian Navy taken prisoners by our Navy were three officers, on board the merchant-man *Ekaterinoslav* owned by the Russian Volunteer Fleet Association, which was captured off Fusan, Korea, on February 6, 1904; the next came four petty officers and men of the destroyer *Steregushchi*, seized at the entrance of Port Arthur, on March 10. The crews of the *Varyag* and *Korietz* blown up near Chemulpo had all been released previously to this, and consequently their wounded were taken on board the French man-of-war *Pascal*, whence they were received into the Temporary Red Cross Hospital at Chemulpo and afterwards transferred to Matsuyama in Japan. They were not treated as prisoners.

The prisoners from the *Rurik* numbered 625, besides a chaplain who was sent to Nagasaki and there released. Of their wounded 2 died while on the voyage and 3 a few days after admission into the Sasebo Naval Hospital, and 154 were conveyed to Matsuyama on August 17; 435 in good health being sent to Matsuyama and Himeji on the 21st, while 31 seriously wounded were kept under treatment at the Sasebo Naval Hospital. Two of them afterwards died, and 29 either recovered or left the hospital improved in health. These were sent to Matsuyama. The Russian naval prisoners taken by us at the capitulation of Port Arthur numbered 5 admirals and officers of equal rank, 290 officers, 60 civil officials, 49 warrant officers and officials of equal rank, and 9,071 petty officers and men, making altogether 9,475, who were quartered in different parts of Japan.

The prisoners taken in the battle of the Japan Sea were 2 admirals, 266 officers and others of equal rank, 5 civil officials, 123 warrant officers and

others of equal rank, 5,710 petty officers and men, making altogether 6,106. Of these 5,310 (with 4 dead and 9 chaplains) passed through the Sasebo Naval Station, and 674 (and one chaplain) passed through the Maidzuru Naval Station. The following table will show the number of Russian naval prisoners taken in the different naval engagements :—

	Admirals & Their Equals.	Officers & Their Equals.	Civil Officials.	Warrant Officers & Their Equals.	Petty Officers & Men.	Total.
<i>Ekaterinoslav</i>	—	3	—	—	—	3
<i>Steregushchi</i>	—	—	—	—	4	4
Battle of Ulsan	—	16	—	4	605	625
Capitulation of Port Arthur	5	290	60	49	9,071	9,475
Battle of Japan Sea	2	266	5	123	5,710	6,106
Total.....	7	575	65	176	15,390	16,213

Of the men of the Russian Navy, men of the medical corps, crews of merchant steamers, etc., the number admitted into our Naval Hospitals for treatment was altogether 486, of whom 434 were admitted into the Sasebo Naval Hospital and 52 to the Maidzuru Naval Hospital. The Sasebo Naval Hospital received its first Russian patient on February 9, 1904,—a stoker of the captured ship *Manchuria* and 6 passengers on board the *Ekaterinoslav* and then on the 15th of the same month 2 men from the destroyer *Steregushchi*, and on the 5th of April a German servant from the steam-ship *Alexandra*. Then in the interval from the 15th to the 20th of August, 11 above the rank of warrant officers, 179 petty officers and men of the medical corps were admitted; and afterwards in the period from May 29 to June 2, 1905, Russian officers, and men to the number 243 were received into the hospital. These last were received after the battle of Japan Sea. The Maidzuru Naval Hospital admitted 52 officers and men after the Japan Sea engagement. Thus the total number of wounded and sick prisoners, men of the medical corps, and those kept in detention, and others admitted into hospitals, amounted altogether to 486. The aggregate number of days' treatment in hospital was 21,283 days, being on an average 43.79 for each person.

Below will be seen tabulated the wounds and injuries of the dead, the seriously and the slightly wounded.

**INJURIES (TO PRISONERS) THAT TERMINATED IN DEATH AFTER
ADMISSION INTO HOSPITALS.**

Injuries.	<i>Rurik.</i>	<i>Dmitori Donskoi.</i>	<i>Sisoi Veliki.</i>	<i>Seytlan.</i>	<i>Orel.</i>	<i>Irtish.</i>	Total.
WHOLE BODY.							
Burns on the Head, Face, Neck, Back, Right Scapular Region, Both Gluteal Regions, Both Forearms & Hands	—	—	—	—	1	—	1
Burns on the Neck, Face, Both Upper Limbs, Back, Lumbar Region, Chest & Both Feet...	—	—	—	—	1	—	1
HEAD.							
Penetrating Wound of the Skull with Fracture of Parietal Bone (abscess of brain)	—	1	—	—	—	—	1
FACE.							
Coutused Wound on the Fore- head with Fracture of Frontal Bone (cerebral lesion)	1	—	—	—	—	—	1
THORAX.							
Penetrating Wound of the Tho- rax with Fracture of Seventh Cervical Vertebra & Seventh Rib (spinal lesion)	1	—	—	—	—	—	1
Penetrating Wound of the Left Thoracic Cavity (pyothorax)	1	—	—	—	—	—	1
Penetrating Wound of the Thorax	—	1	—	—	—	—	1
THORAX & ABDOMEN.							
Penetrating Wound of both Thoracic & Abdominal Cavities with 9th Rib fractured.....	—	—	—	—	—	1	1
Contusion on Thorax & Ab- domen with Traumatic Peri- tonitis	—	1	—	—	—	—	1
ABDOMEN.							
Penetrating Wound of Abdominal Cavity (traumatic peritonitis)...	—	—	—	—	1	—	1

Injuries.	<i>Rurik.</i>	<i>Dmitri Donskoi.</i>	<i>Sisoï Veliki.</i>	<i>Svyellana</i>	<i>Orel.</i>	<i>Irish.</i>	Total.
BACK.							
Penetrating Wound into the Vertebral Canal (spinal lesion)	—	—	—	—	—	1	1
UPPER ARM.							
Right Upper Arm blown off.....	1	—	—	—	—	—	1
Perforating Wound of the Upper Arm with Fracture of the Humerus	—	—	—	1	—	—	1
Gangrene of the Left Upper Ex- tremity	—	1	—	—	—	—	1
THIGH.							
Lacerated Wound of the Right Lumbar Region & Perfora- ting Wound of the Right Thigh with Fracture of the Femur	1	—	—	—	—	—	1
Perforating Wound of the Left Thigh	—	1	—	—	—	—	1
Blind Wound of the Right Thigh with Fracture of the Femur	—	—	1	—	—	—	1
Wounds with Extensive Loss of Soft Tissues of the Left Thigh (septicaemia)	—	1	—	—	—	—	1
Contused Wound of the Right Thigh (coxitis)	—	—	—	—	1	—	1
LEG.							
Perforating Wound of the Right Leg with Fracture of the Tibia & Fibula (tetanus)	—	1	—	—	—	—	1
EXTREMITIES.							
Compound Fracture of Bones of the Left Forearm, of Metacar- pal Bones of the Hand, of the Left Femur & the Lower Leg	—	1	—	—	—	—	1
Total	5	8	1	1	4	2	21

SEVERE

Wounds.	Head.	Ear.	Face.	Eye.	Neck.	Chest.	Back.
Perforating Wound with Comminuted Fracture	—	—	—	—	—	—	—
Perforating Wound with Fracture (the upper limb paralyzed as to both sensibility & motion)	—	—	—	—	—	—	—
Perforating Wound with Fracture (radial nerve paralyzed)	—	—	—	—	—	—	—
Perforating Wound with Fracture	—	—	1	—	—	—	—
Perforating Wound with Incomplete Fracture (arthritis)	—	—	—	—	—	—	—
Perforating Wound with Incomplete Fracture...	—	—	—	—	—	—	—
Perforating Wound.....	—	—	—	—	—	3	—
Perforating Wound (sciatic nerve injured).....	—	—	—	—	—	—	—
Perforating Wound (traumatic aneurism).....	—	—	—	—	—	—	—
Blind Wound with Comminuted Fracture	—	—	—	—	—	—	—
Blind Wound with Fracture.....	1	—	3	—	—	2	—
Blind Wound with Incomplete Fracture.....	—	—	1	—	—	—	—
Blind Wound	1	—	—	—	—	1	—
Blind Wound (followed by secondary hæmorrhage).....	—	—	—	—	—	1	—
Blind Wound (femoral vein ruptured).....	—	—	—	—	—	—	—
Blind Wound (cataract)	—	—	—	1	—	—	—
Penetrating Wound with Fracture	2	—	—	—	—	—	—
Penetrating Wound (pyothorax)	—	—	—	—	—	1	—
Penetrating Wound (hæmothorax).....	—	—	—	—	—	1	—
Penetrating Wound (faecal fistula)	—	—	—	—	—	—	—
Penetrating Wound (panophthalmitis).....	—	—	—	1	—	—	—

WOUNDS.

[illegible]

Wounds.	Head.	Ear.	Face.	Eye.	Neck.	Chest.	Back.
Penetrating Wound	—	—	—	1	—	3	—
Lacerated & Mutilated Wound.....	—	—	—	—	—	—	—
Mutilated Wound with Fracture.....	2	—	—	—	—	—	—
Contused Wound with Incomplete Fracture ...	—	—	1	—	—	—	—
Contused Wound	1	—	—	3	1	1	—
Contused Wound with Fracture (phlegmon)...	—	—	—	—	—	—	—
Lacerated Wound with Fracture	1	—	1	—	1	—	—
Lacerated Wound.....	—	—	—	—	—	1	—
Wound with Loss of Soft Tissues & Fracture (tendons & nerves injured).....	—	—	—	—	—	—	—
Wound with Loss of Soft Tissues.....	—	—	—	—	1	—	—
Simple Fracture	—	—	—	—	—	—	—
Explosion Wound (dry pleurisy)	—	—	—	—	—	1	—
Burns	1	—	1	—	1	1	—
Traumatic Cataract	—	—	—	1	—	—	—
Total.....	9	—	8	7	4	15	1

Remarks:—Seventeen serious wounds of secondary importance found on dead bodies,

Abdomen.	Lumbar Region.	Scapular Region.	Upper Arm.	Elbow.	Forearm.	Hand.	Finger.	Thigh.	Knee.	Leg.	Ankle.	Foot.	Total.
—	—	—	—	—	—	—	—	—	—	—	—	—	4
—	—	—	2	—	—	—	—	—	—	1	—	—	3
—	—	—	—	1	2	4	—	—	—	2	—	2	13
—	—	—	—	—	—	—	—	—	—	—	—	—	1
—	1	—	—	1	1	1	—	1	—	2	—	—	13
—	—	—	—	—	—	—	1	—	—	—	—	—	1
—	1	—	—	—	—	1	—	2	—	2	—	—	9
—	—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	—	—	—	1	—	—	—	—	—	1	—	2
1	1	—	1	—	—	—	—	3	—	1	—	—	8
—	—	—	2	—	—	—	—	2	—	1	—	—	5
—	—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	—	—	—	—	2	—	—	—	—	—	—	6
—	—	—	—	—	—	—	—	—	—	—	—	—	1
2	3	5	12	4	13	9	1	17	4	25	2	8	149

are included here, together with their principal wounds.

SLIGHT

Wounds.	Head.	Ear.	Face.	Eye.	Neck.	Chest.	Back.	Abdomen.
Perforating Wound with Fracture	—	—	—	—	—	—	—	—
Perforating Wound	1	—	2	—	3	7	1	—
Blind Wound with Fracture.....	—	—	—	—	—	—	1	—
Bind Wound.....	4	—	5	—	5	19	4	5
Blind Wound (bleeding from radial artery)	—	—	—	—	—	—	—	—
Contused Wound with Fracture.....	1	—	1	—	—	—	—	—
Contused Wound	19	—	17	5	7	8	9	1
Contusion	1	—	1	1	—	3	1	—
Mutilation	—	—	—	—	—	—	—	—
Abrased Wound ..	1	—	2	—	2	5	4	—
Abrasion.....	2	—	2	—	1	—	—	1
Lacerated Wound with Right Upper Incisors & Canines broken.....	—	—	1	—	—	—	—	—
Mutilated & Lacerated Wound.....	—	1	—	—	—	—	—	—
Lacerated Wound.....	1	—	1	—	—	—	—	—
Rupture of Tympanic Membrane.....	—	6	—	—	—	—	—	—
Shell Wound.....	3	—	1	2	1	2	2	—
Explosion Wound.....	—	—	—	—	—	2	1	1
Scalds	—	20	16	—	6	4	5	—
Incised Wound.....	2	—	—	—	—	—	—	—
Sprains	—	—	—	—	—	—	—	—
Total.....	35	27	49	8	25	50	28	8

Remarks:—212 cases of slight wounds of secondary importance on the dead & the

WOUND.

Lumbar Region.	Gluteal Region.	Perineal Region.	Scapula.	Upper Arm.	Elbow.	Forearm.	Hand.	Finger.	Thigh.	Knee.	Leg.	Ankle.	Foot.	Toe.	Total.
—	—	—	—	—	—	—	1	2	—	—	—	—	—	—	3
2	3	—	5	11	2	7	—	—	11	1	5	—	4	—	65
—	—	—	—	—	—	1	—	1	—	1	1	—	—	1	6
6	12	—	14	15	—	10	2	3	31	5	33	5	6	—	184
—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1
—	—	—	—	—	—	—	1	4	—	—	—	—	2	1	10
4	6	1	7	9	7	9	10	13	40	9	28	1	16	7	233
3	—	1	1	5	—	4	—	—	4	4	4	—	2	2	37
—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	2
2	2	—	4	9	1	6	1	2	6	2	8	—	—	—	57
—	—	—	—	4	—	4	1	—	6	1	3	—	—	1	26
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	2
—	—	—	—	1	—	2	—	—	1	—	—	—	1	2	9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
2	2	—	9	4	—	3	1	—	—	1	4	—	1	—	38
2	3	—	1	3	—	4	2	1	5	—	3	—	—	—	28
1	3	—	2	2	3	6	22	8	—	—	8	—	5	—	111
—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	3
—	—	—	—	—	—	—	—	—	—	—	—	4	—	—	4
22	31	2	43	63	13	57	41	36	104	24	97	10	39	14	826

severely wounded are here included.

CHAPTER IV.

BRIEF HISTORY OF IMPORTANT CASES OF THE WOUNDED AND KILLED.

SECTION I. DEATHS FROM INJURY AND DROWNING, AND THE RESULT OF EXPOSURE TO EXTREME COLD.

The total number of the killed, whose wounds could never be ascertained was 1,267. Of these, 1,069 belonged to those of our warships and destroyers that were sunk by mines outside Port Arthur. These men either perished in the flames and steam, or were struck by flying objects and thrown overboard, or went down with the sinking vessels in such a way that their corpses could not be recovered. The majority of the men killed in this way belonged to the ships and boats engaged in the third blocking expedition, a smaller number were hurled overboard by the explosions of Russian shells during the naval battles of the Yellow Sea, of Ulsan, and of the Japan Sea. These have been classified under special name of the 'Deaths from injury and drowning' as distinct from other kinds of injuries (refer to the table given in the pages 617—618). Again, among the larger number of the killed at the sinking of the *Takasago* on December 13th, 1904, not a few were probably simply frozen to death while drifting about in the wintry sea. These have all, however, been included amongst the 'Deaths from injury and drowning.' Nine of these cases, indeed, when picked up by the *Otona* were frozen, apparently to death, every form of treatment failing to resuscitate them from their long sleep. We shall now give three cases of 'Wounded and drowned' and one of 'Frozen to death.'

I. Wounded and Drowned:—K. K., aged 22, an ordinary seaman on the *Chokai*, was on May 26th, 1904, participating in the bombardment of the forts at Nan-shan, when he was wounded by a hostile shell at 7 o'clock a.m. and blown overboard. He was seen drifting about by the side of the ship, but sank before help could reach him. It was surmised that he had sustained serious injuries in the face and abdomen.

2. **Wounded and Drowned:**—K. M., aged 22, an able seaman of the *Adzuma*. During the engagement fought on May 27th, 1905, in the neighbourhood of Okinoshima, a hostile shell exploded against the upper part of No. 7 6-in. gun casemate at 5.50 p.m. He and his comrades, who were serving as gun-crew to aft No. 9 12-pounder gun which stood just above the said casemate, were wounded by the shell, which carried him overboard. His corpse was not recovered.

3. **Wounded and Drowned:**—C. O., aged 25, a first class stoker on board the *Shiranui*. In the naval battle off Okinoshima on May 27th, 1905, he was on duty in No. 1 boiler room, when at 3.55 p.m. a hostile shell came from the front on the port side, and struck No. 1 boiler. The steam issuing from the broken boiler covered him and his mates with scalds; and he was never seen again after the accident. Some one, it is said, saw him rushing out of the boiler room and reaching the upper deck by the ladder, and it seems to be probable that after once making his escape from the boiler room he found himself too weak to stand the motion of the ship and was thrown overboard. Indeed, at that moment, everything in front was shrouded and obscured by the explosion, smoke and steam bursting forth from the fore part of the ship, and in consequence he could be seen no more.

4. **Death from Exposure to Extreme Cold:**—Staff Surgeon T. K., aged 38, Chief Medical Officer on board the *Takasago*. At the time when the *Takasago* sank at 12.05 a.m. on December 13th, 1904, he went down with the ship and was rescued at 1.55 a.m. by the *Otowa*. He looked cyanosed, his limbs were cold, his pupils dilated, there was no pulsation of the radial artery, though cardiac sounds were faintly audible and unconsciousness had set in. A mirror held over his mouth became clouded, but no respiratory sound could be audible. On the inner sides of both the right and left forearms, several abraded wounds were recognized. Artificial respiration, injection of camphorated ether, the rubbing of the skin, light patting of the chest and other means of first-aid were given, but with no avail, and the patient at length expired.

SECTION II. BURNS, SCALDS, AND EXPLOSION-WOUNDS.

The number of cases of burns, scalds, and explosion-wounds that occurred to members of our Navy during the whole period of the war, amounted to 480 as shown in the following table:—

Injuries.	Principal Injuries.							Injuries Complicating.		
	Instant Death.	Death after Injury.	Death after Admission into Hospitals.	Invalided.	Serious Injuries that recovered in Hospitals.	Slight Injuries that recovered in Hospitals.	Treated on Board.	Serious Cases.	Slight Cases.	Total.
Scalds	22	5	1	—	5	14	15	—	—	62
Burns	6	1	2	4	6	64	64	30	41	218
Explosion-Wounds.....	—	—	—	—	1	41	49	20	69	180
Total.....	28	6	3	4	12	119	128	50	110	460

The scalds were chiefly caused by steam issuing from boilers or steam-pipes of destroyers and torpedo boats, destroyed by shells from the enemy; the cases numbered 62 in all. The chief causes of the burns were the flames of explosions of gunpowder and mechanical mines. There were, however, some cases of burns inflicted during combat by contact with a heated gun or cartridge case, and in some cases while working in boiler rooms. The total cases of burns produced by these various causes numbered 218. As to the severity of the injuries, most of the cases were of the second degree, while those caused by magazine explosion included some cases of the third degree, among the burns from "sundry causes,"* there were some cases of the first degree. In the burns inflicted by bursting shells, the injured locality was, in many cases, further irritated by fragments of the shell, of the flying embers, this being shown by linseed-sized or pea-sized black spots, reaching to the derm, all over the sore surface of the burn. From this kind of burns should be distinguished the scalds and burns smeared over with coal dust (though these at a glance appear to be of the same nature) that sometimes occur on board a destroyer or torpedo boat.

By explosion-wounds we mean injuries produced by exploded powder entering into the skin—especially in exposed parts, and leaving spots in which remains the penetrating residue of the explosives, or a number of slight abraded wounds

* As to the definition of the "sundry causes," refer to Sect. II, Chapter III, Book III.

or of small contused ones. As a rule, such a wound comes when a man is posted not far from the spot where the explosion of a projectile or a submarine mine occurs, yet not so near it as to be touched by the flames. Sometimes it happens that while one part of the body receives a burn, another place sustains an explosion-wound. Indeed, the explosion-wound itself is a kind of burn. It is often difficult to distinguish it from small contused wounds or abrasions caused by wooden splinters or other indirect missiles produced at the moment of an explosion. It is true that in an explosion-wound the injured surface does not leave an extensive cicatrix behind, which fact may serve to distinguish it from a burn; the rupture of the membrana tympani is however a complication common to both, and besides, an explosion-wound may, like a burn, also be found along with other wounds of a serious nature.

In order to give a general idea of scalds, burns and explosion-wounds as produced in naval engagements, we shall now describe nine cases which came under our hands.

5. Scalds of the Face, Cervical Region, Forearms, Gluteal Region and Lower Limbs:—H. U., aged 21, a stoker of the *Akatsuki*. While the vessel was engaged in a combat with a Russian destroyer outside Port Arthur, on March 10th, 1904, he was struck by the steam bursting out of the third boiler room, and sustained scalds of the first and second degrees, extending from the face down to the ends of the fingers along the cervical region, over both forearms, and from the hips on both sides down to the ankle-joints. Gingly oil was applied to the injured parts, which were then dressed, and at about 10 a.m. the man was removed to the *Mikasa*. At this time, there was no mental disturbance present, but the patient complained of severe pain in the injured parts, which necessitated the hypodermic injection of morphine solution. The injuries to the face and cervical region were of the first degree in severity, with injection in the bulbar conjunctivae; the corneas were found intact, but the pupils slightly contracted. The injuries to the forearms down to the fingers were of the first and second degrees; the palms of both hands presented a black colour as if they were grimed with coal dust, and the epidermis was entirely stripped off. The lesions of both lower limbs—from the buttocks down to the feet—consisted of scalds of the first and second degrees; a large vesicle was found formed on the gluteal region, and the epidermis on the front side of each thigh was gone,—leaving the parts in a sore condition; the dorsum of each foot had sustained nothing more than scalds of the first degree.

The mouth and the pharynx had also scalds of the first degree.

Auscultation revealed rhonchus and whistling, a symptom of bronchial catarrh, and the voice was hoarse. This was probably because the patient had inhaled hot steam, which had scalded the respiratory tract. Temperature was 37.6°C.; pulse faint and counted 80; 20 grammes or more of urine mixed with blood were passed through a catheter. Lint with boracic ointment was applied to the face and cervical region; the vesicles on the forearms, hands, buttocks, and lower limbs were emptied and a wet picric acid dressing was applied. Then the patient was removed to the receiving station on the quarter deck to take some quiet rest. A diluted muriatic acid lemonade was given to quench his thirst; but even this proved difficult of deglutition on account of the irritation to the pharynx, so we had to allow him a little quantity of tepid water which had been boiled once. About 11.30 a.m. collapse gradually set in and a small quantity of watery fluid was vomited. From about 1 p. m. the patient began to complain of colic, and respiration became irregular. Hypodermic injections of two syringefuls of ether with camphor, were tried, but without effect, and the patient succumbed to his injuries at 1.50 p.m. on board the *Mikasa*.

6. Scalds of the Face, Trunk, and the Upper and Lower Limbs on Both Sides :—
O. T., aged 23, a second class stoker on the *Tatsuta*. At 10.15 p.m. on the 21st of November, 1904, when the vessel, in the course of the forced blockading of Port Arthur, was cruising off Yüen-tao, he was on duty in the boiler room of the vessel, where he received extensive scalds of the trunk. He was immediately given the first step of relief, and was admitted on the following day, the 22nd, to the Hospital Ship *Saikio Maru*. On examination, he was found to have sustained scalds of the second degree on the whole of the face, the cervical region, the right upper limb, on the lower two-thirds of the left upper limb, on the right and left lower limbs (excepting a part of the posterior surface of the thighs as well as the feet), on the back of the chest and the whole of the anterior surface of the abdomen. The upper half of the anterior surface of the breast was covered with scalds of the first degree. In all parts injured to the second degree, vesicles were formed which were of the size of a bean to a palm; the epidermis was stripped off here and there leaving ulcerous surface behind. Temperature rose to 38.1°C.; the countenance was drawn, the voice hoarse, the pulse counted 120; nausea occurred from time to time, and the patient groaned in agony. Albumin was detected in the urine, and collapse set in. Stimulants were administered, and cloths steeped in oil were applied to the surfaces of the injured parts. The injuries took a very favourable course after that, and the alarming general symptoms abated in four or five days; the scalded





I. N. HIRED BARBER. *HIATSUSE*. BURNS ON THE FACE AND BOTH HANDS. (7.)

parts got well dried in about ten days except those on the back, upper limbs and thighs. The patient was transferred, on December 1st to the Sasebo Naval Hospital. At this time, sore surfaces of the size of a bean or of the palm of a child's hand still remained on the parts above mentioned, but they became gradually contracted, and on the 17th following, the only sore surfaces, that were to be found still lingering, were a palm-sized one on the right forearm, an egg-sized one and one of the size of a thumb-head on the right thigh. The patient was removed to the Kure Naval Hospital, on the 21st following, and under certain treatment there, the injured parts completely healed by the beginning of February, 1905, the next year. But unfortunately, about the 8th of the same month, spasms of the diaphragm set in, recurring at first three or four times a day, but later gradually increasing in frequency, until they reached from ten to fourteen times a day. Such fit lasted some thirty minutes. During the attack the patient felt great distress; he could not speak, and he complained of the headache. Hypodermic injection of morphine and the application of galvanic current were tried, but without marked effect. In consequence, the bodily strength became greatly impaired, but in the intervals of the attack, the patient felt quite easy as if he were in a normal condition of health. From the 15th of the same month, inhalations of nitrite of amyl or of chloroform were prescribed, which had the effect of arresting each fit. From the 26th, the number of the fits began to decrease, that occurring on the 13th March, proving to be the last one. The headache also disappeared spontaneously, and the patient left the hospital completely recovered, on the 2nd of April. The number of days' sickness required before recovery was 132.

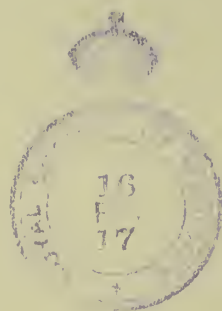
7. Burns of the Scalp, Face, Neck, Upper Extremities, and Left Ankle-Joint:—
I. N., aged 22, a barber on the *Hatsuse*. At the moment of the disaster that occurred to the *Hatsuse* at 12.34 p.m. on May 15th, 1904, he was injured by the flames from the magazine, and falling overboard, was picked up by the *Tatsuta*. Examination revealed: (a) on the head a burn of the third degree, covered with black eschar; (b) on the face, the epidermis stripped off from the hair margin on the forehead as far as the back on both ears and the lower portion of the lower jaw; the eye-lashes and eye-brows singed and the palpebral conjunctivæ remarkably congested, though the eye-balls showed nothing abnormal. (c) The upper limbs on both sides had burns either of the second or third grade on the part below the lower one-third of the forearm, and what was specially noticeable was that the dorsum of the right hand and fingers and the posterior surface of the lower part of the forearm on the same side was covered over with hard leathery eschar, with blood oozing through here and there. (d) A burn encircled the neck, like a band.

It was of a slight grade of severity. (e) Just below the external malleolus of the left ankle-joint was a burn of the second grade, which gave the patient very severe pain. After treatment, he was removed on the 16th from the *Tainan Maru* to the Hospital Ship *Kobe Maru*, from which he was transferred to the Sasebo Naval Hospital on the 19th following. At this time, his temperature stood at 38.8°C., and the burns of the scalp, face, and forearms were remarkably swollen with discharge of pus, owing to the onset of inflammation. Delirium supervened at times; quiet sleep at night was lost, and the patient became so restless that he got out of bed and wandered about the room. The bandages were soiled with a thick pus which was of a green colour and very offensive. On giving pressure to the scalp copious pus escaped, so that the bandages had to be changed twice a day. On the 24th of May, the discharge of pus abated suddenly, the mind grew obscure, and the œdema of the lungs supervened; leucocytes in the blood considerably increased; the cardiac sounds became fainter, and all the symptoms growing worse and worse, the patient at last died at 5 p.m. on the 27th. The number of days' sickness was twelve. Refer to photograph (7).

8. Burns of the Face, the Right and Left Scapular Regions, and Both Hands; with Simple Fracture of the Left Ring Finger:—S. T., aged 21, a third class stoker on the *Hatsuse*. When the *Hatsuse* sank at 12.34 p.m. on the 15th of May, 1904, he sustained wounds and was rescued by the *Tatsuta*. On examination, he was found to have (a) a burn of the first grade extending over the face and as well as some of the first and second grades on both angles of the lower jaw, on the back of both ears, and on the part over the manubrium of sternum; (b) burns of the first and second grades extending from both wrists to the back of the fingers. Besides these, there were an egg-sized burn of the first grade on the right scapular region and several spindle-shaped burns of the first grade, 3 to 5 cm. in length, from the left scapular region down to the middle of the upper one-third of the upper arm on the same side. The patient was admitted on the 16th from the *Tainan Maru* to the Hospital Ship *Kobe Maru*, and on the 19th was transferred to the Sasebo Naval Hospital. At this time, the face and the whole posterior aspect of the parts from the wrists down to the fingers had Malpighian layer exposed, attended by severe pains and liable to bleed; copious discharge of pus, and propagation of the bacillus pyocyaneus was going on. Temperature indicated 38.5°C. On May 26th, the temperature went down, and then granulation setting in steadily, the injuries were perfectly healed on June 9th. Owing, however, to cicatricial contraction, the fingers of the left hand became fixed in the outstretched position, so that the muscular strength



S. T. STOKER. *HATSUSE*. BURNS ON THE FACE AND
BOTH HANDS. (8.)



of the hand was ascertained to be reduced to twelve kilogrammes by the dynamometric test. In spite of the complete healing of the burns, there still remained a tender point at the middle phalanx of the left ring finger. On careful examination, the phalanx was found to have sustained a simple fracture, which later terminated in union. On December 16th, the patient was discharged from service and left the hospital. The number of the days' treatment was 215.—Refer to photograph (8).

9. Burns of the Whole Body :—T. N., aged 25, a leading seaman on the *Fuji*. During the engagement off Okinoshima, on May 27th, 1905, he was loading ammunition in the after turret, when at 3 p.m. a hostile shell exploding in the turret, set fire to the ammunition. On examination, it was found that in some parts of the back, lumbar region, and both lower limbs, the epidermis had been stripped off exposing ulcerated papillar layers, and that in various other parts large vesicles had been formed. The skin of the head and face with the nape of the neck, breast, abdomen, and the upper limbs, presented a dark-brownish colour, and was dry, with its epidermis exfoliating. At the moment of the injuries, he was in very excited state; the respiration was shallow, the pulse fine and frequent, and vomiting constantly occurred. Morphine was given hypodermically, boracic ointment and the gauze moistened with picric acid solution were applied to the burnt surfaces. Then the patient was placed in a recumbent position for quiet rest, but continued in a state of incessant jactitation. After an hour, another syringeful of morphine solution was injected. At about 12 at night on the 28th, symptoms of collapse supervened and the patient expired at 6 in the morning. The course lasted only one day.

10. Burns of the Scalp, Face, Upper Limbs, and Right Leg; Explosion-Wounds on the Right Upper Arm; a Blind Wound of the Head; Rupture of the Left Membrana Tympani, and Concussion of the Right Labyrinth :—N. M., aged 29, a first-class petty officer on the *Fuji*. During the battle off Okinoshima on May 27th, 1905, a shell from the enemy exploding in the after turret caused secondary explosion of the ammunition therein at 3 p.m., when he was wounded as he stood at the second post, that is, on the right side behind the gun. On examination, hairs of the head and eye-brows were entirely singed off; the scalp and face were remarkably swollen, presenting a dark-brown colour and covered with minute foreign bodies. The zygomatic region, the angle of the mouth, the pinnae of both ears, and neck had vesicles here and there. The right upper limb had over 70 wounds of the size of a millet-seed on the part from the scapular region to the arm, caused by powder-grains shot into it and remaining inserted, and the skin around the wounds was reddened. All the part from the lower extremity of the right arm down to

the end of the fingers, excepting the palm of the hand and the inner side of the forearm, and the whole part from the lower one-third of the left arm down to the end of the fingers, save the palm of the hand, were swollen and of a dark-brown colour, with numerous vesicles and loss of the epidermis here and there. The right lower extremity was stripped of the epidermis in the part extending from the front of the knee-joint downwards and outwards, and the skin about the wounded part was flushed. Above the external malleolus of the right ankle, was found a vesicle formed transversally like a band, which was 8 cm. in length and 2 cm. in width. Again, at a distance of 2 cm. forward from the middle of the coronal suture, there was a wound of the size of a millet-seed, which was ascertained to reach the periosteum and to retain foreign bodies. By means of an incision of 1.5 cm. into the wound, we were able to extract two iron fragments, one the size of a grain of rice, the other that of a grain of millet, after which the wound was sutured.

On May 20th, the patient was sent to the Sasebo Naval Hospital, and there treated successfully, first for the blind wound on the head and the burns of the face, and then for the burns of the right leg. From about June 10th, the burns on the forearm and dorsum of the hands began to be painful, with granulating surfaces of irregular shape: towards the end of July they had at last healed up, leaving behind them, however, thick cicatrices. These cicatrices contracted in course of time, with the result that the wrist, metacarpophalangeal, and interphalangeal joints became stiffened; and the cicatrices themselves were so weak that they repeatedly broke, with ulcer formations of various sizes which prevented the wounds from settling properly until the beginning of October.

In addition to the above injuries, the man complained, during his stay in hospital, of difficulty in hearing. Examination showed that the left tympanic membrane had been perforated. The watch-test showed 1/200, and though the membrana tympani of the right ear had not been ruptured, yet the acuteness of hearing was reduced to 10/200. Weber's experiment was lateralized to the left, and Rinne's test positive in both ears. On October 10th, the patient was removed to the *Kobe Maru* for transmission to the Kure Naval Hospital, and was placed under the care of the latter on the 12th following. In the course of the treatment he received there, the cicatrices became hard, but on account of their ensuing contraction, the right and left wrist-joints and the interphalangeal joints became still more stiffened, thus causing a diminution of the muscular strength of the hands. The perforation of the left tympanic membrane remained unclosed, both the bone and the air conduction being impaired in both ears, and the

acuteness of hearing was remarkably reduced. The patient was invalided and dismissed from the hospital on January 4th, 1906. The number of the days' treatment was 222.

11. Abrased Wounds and Contusions over the Whole Body from Mine Explosion :—

J. N., aged 39, a warrant officer on torpedo boat No. 48, was at work on the upper deck of the boat on May 12th, 1904, when at 12.25 p.m. the boat happened to strike against a mine and went down. He was hurled once up into the air, and fell wounded into the sea, being rescued by the *Miyako* at 1.10 p.m. The skin all down his back, the gluteal region, and the inner side of the right lower limb, were found to present a purple-red colour; he complained of severe pain all over the body, and especially about the lumbar vertebral region. This caused a state of jactitation, attended by constant vomiting of blood and evacuation of bloody stools. Consciousness was also somewhat deranged, and his replies to questions were vague and far from the point; the eyeballs turned up a little, the pupils were dilated, their reaction was dull. The pulse was frequent and fine, the breathing difficult, the limbs cold. The patient was placed at quiet rest, followed by the hypodermic injection of a stimulant and the application of cold lotions to the discoloured parts. He was admitted to the *Kôbe Maru* at 6 in the afternoon when his consciousness was clear, and his replies appropriate, but he complained incessantly of acute pain in the chest, and kept both lower limbs firmly bent at the hip-joint. Pulsation was faint and counted 120; vomiting of blood occurred at intervals, and his coughing was accompanied by hæmoptysis. The wounds were as follows: (a) an abraded wound 20 cm. in length and 4 cm. in breadth on the ulnar side of the right forearm, (b) a thumb-head-sized abraded wound on the mammary line in the second intercostal space of the left chest, (c) an abraded wound five cm. long and two cm. wide extending inward and downward from the middle part of the left scapular region, (d) an abraded wound four cm. in length and two cm. in width extending from the 4th lumbar vertebral region to the upper part of the sacrum, (e) an abraded wound three cm. long and two cm. wide at the middle part of the left gluteal region. Above this wound was an abraded wound, the size of a finger-tip, and two similar wounds respectively on the ruga of the left gluteal region and on the posterior aspect of the middle part of the left thigh, which were all covered with black scabs, (f) on the outer side of the right thigh there were five abraded wounds each six cm. in length and three cm. in breadth, covered with blood clots; extending from the outer side of the right knee-joint to the middle of the upper one-third of the outer side of the leg, there was a Y-shaped abraded wound, which was covered with a black scab, and again, at the

boundary of the middle and lower one-third of the right leg, were found twenty abraded wounds of various sizes, also covered with black scabs, (g) on the inner side of the left knee-joint and below it, were 3 ecchymosed areas of the size of a pigeon's or a hen's egg, eight abraded wounds one to three cm. long located from the upper one-third to the middle one-third of, and on the inner side of, the left leg, and seven abraded wounds, one to three cm. in length, at the centre of the lower one-third of, and on the outer side of, the same leg; all these wounds were covered with black scabs and were each surrounded by numerous ecchymotic maculae. The patient was ordered to take quiet rest, followed by the hypodermic injection of morphine and the application of ice-bags all over the breast, but without effect. At 7.35 p.m. the man died of collapse due to pulmonary and gastric hæmorrhage.

12. Burns of the Face; Explosion-Wounds of the Face and the Left Upper Limb; Rupture of the Right and Left Tympanic Membranes:—J. K., aged 22, an ordinary seaman belonging to the *Hatsuse*. During the first attack on Port Arthur on February 9th, 1904, he was engaged in loading cartridge-cases as one of the gun-crew of No. 19 starboard 12-pounder gun in the 10th section on the middle deck, when a shell struck and entered the admiral's cabin and there exploded. On examination, he was found to have (a) burns of the first and second degrees on the face, the hair of the head was burned off, the right and left eye-lids were swollen so as to prevent them from opening, and the conjunctivæ of the eye-balls tremendously swollen though the corneas were uninjured. On the outer half of the right brow, there was a contused wound reaching the subcutaneous tissue and about two and half cm. in length; also, in the right zygomatic region was a contused wound about three cm. long, which reached the bone, and ran obliquely down from its upper and outer part; (b) a contused wound on the left side of the parieto-occipital suture running lengthwise for some two cm. and reaching the subcutaneous tissue, (c) a pea-sized contused wound at the centre of the dorsum of the left hand, which measured two cm. in its downward and inward depth, and had the margin swollen to the size of a hen's egg; (d) on the left arm, were found innumerable small contused wounds reaching the subcutaneous tissue of the size of a pea or a pin-head; (e) in the postero-inferior portion of the right tympanic membrane was a small spot of hæmorrhage, the margin of which was generally congested. As regards the left ear, a blood clot in the auditory meatus prevented the examination of the tympanic membrane. The patient complained of pain in both ears and was almost deaf. At the moment of receiving his injuries he lost consciousness, but came to himself while being conveyed to the dressing station. Vaseline was applied to the ex-



M. Y. LEADING SEAMAN. *ITSUKUSHIMA*. EXPLOSION
WOUNDS. (13.)

plosion-wounds, the wounds in the right brow and the right zygomatic region were sutured, followed by the application of sterilized dressing, and both ears were plugged with dried cotton wool. On the 11th following, the patient was sent home on board the *Genkai Maru* and admitted to the Sasebo Naval Hospital on the 13th. On examination in the hospital, burns of the first and second degrees were found on his face, in the left upper limb were numerous explosion wounds of the size of a millet-seed or of a red bean, imbedded in which were found gunpowder grains, and wounds of the size of a broad bean both on the right brow and on the right cheek, which presented slight inflammation. Both the tympanic membranes were ruptured, attended by the discharge of pus from the right ear and by a marked impairment of hearing. The burns healed by February 17th, the wounds in the face by March 20th. The openings of the ruptured tympanic membranes became gradually smaller, that on the right was completely closed with the restoration of hearing to 15/200, but the hearing of the left ear remained dull. However, as the man had not much difficulty in hearing others speak, he was dismissed from the hospital on June 25th following. The course had a run of 137 days.

13. Contusion, and Contused Wounds and Abrasions partaking of the Nature of Explosion-Wounds, of the Head, Face, and the Right Upper Limb, (Concussion of the Brain):—M. Y., aged 26, a leading seaman on the *Itsukushima*. At 9.49 a.m. on August 9th, 1904, he was participating in the fight off Lung-wan-tang when he sustained wounds, and presently showed remarkable symptoms of concussion of the brain. He was the same day admitted to the Hospital Ship *Kobe Maru*. On examination there, the patient was found (*a*) to have a contusion the size of a two-penny piece in the left temporal region, several contusions varying in size from a broad bean to a nut or a hen's egg in the fore part of the left pinna, and others of the size of a pea or bean on the lips and eyelids. The face was generally swollen, so that the eyelids could not be opened. There were, further, numerous small abraded wounds scattered about on the whole posterior aspect of the right arm and forearm. (*b*) The right scapular region was found slightly swollen and pain was felt in raising the right upper extremity. (*c*) In the right temporal and zygomatic regions, there was in each a shallow contused wound three cm. in diameter and numerous bean-sized contused wounds at the lower end of the posterior aspect of the right forearm: (*d*) on the anterior aspect of both lower limbs, there were abraded wounds of the size of a grain of linseed or a pea. The symptoms of concussion of the brain disappeared shortly after admission to the hospital ship. After application of aseptic dressing, and, especially to the right scapular region, of cold lotion of aqua plumbi, the œdema of the face and

the right upper limb abated, and by the 20th following, all the wounds were healed, the swelling and pain in the right scapular region disappearing on the 28th. The patient left the hospital ship completely recovered on the 30th of August. The number of days' treatment was 21. Refer to photograph (13).

SECTION III. WOUNDS RECEIVED IN NUMEROUS PARTS OF THE BODY.

Persons wounded during an engagement by a bursting shell (this is also the case with persons wounded by an exploding submarine mine), are apt to be struck simultaneously by numerous fragments of shell and splinters of other objects, or by explosion-gas, and it often happened during the war that the victims had a large part of their bodies shattered and blown away without hope of restoration (refer to cases 14, 15, and 16). Others again had their heads and trunks cut asunder, or their limbs mutilated, scarce a clue remaining by which the corpses could be identified. Of the former we had, during the whole war, a total of twenty-three, of the latter about twice that number. There were also some few, who, in spite of numerous serious injuries sustained over the whole body, were fortunate enough to survive their wounds.

Case 17, which we describe below, was caused by the explosion of a mine, and died on board the hospital ship. There were many sufferers in this catastrophe:—twenty-two were killed on the spot, three invalided, two treated in hospitals and dismissed on recovery, and six treated on board the hospital ship. Case 18 was caused by a secondary explosion, which at the same moment produced other casualties, viz. fourteen killed, five invalided, five treated in hospitals till cured, and six others treated on the hospital ships. Case 19 was the result of an explosion of gun-cotton at the moment of capturing the Russian destroyer *Ryeshitehni*. Other casualties occurred at the same time: one was wounded and drowned, two invalided, four treated and cured in hospitals, and nine treated on board. Case 20 was the result of a catastrophe which produced eleven other cases of wounded and drowned among the crews of vedette-boats outside Port Arthur. Case 21 was produced at Huo-shih-ling together with four others killed and six wounded, in the course of the bombardment of the back of Port Arthur. Case 22 was caused by a hostile shell on the upper deck of *Ka-*

suja : other casualties that happened simultaneously were two cases of smashing of the whole body, three, of mutilation of the abdomen and the head, or of wounds and drowning, two cases of fatal wounds, and eleven other cases of injuries. In each of those cases, the wounded received numerous wounds at one time,—striking evidence of the disastrous power of destruction possessed by shells and mechanical mines.

14 & 15. Two Cases of Smashing of the Whole Body:—E. M., aged 22, a first class stoker, and E. A., aged 20, a second class stoker on the *Mikasa*. During the battle fought off Shan-tung Promontory on August 10th, 1904, these men were posted as members of the forward fire brigade, in the third compartment of the lower deck, when at 6.30 p.m. a 12-in. shell broke into the said compartment and exploded, killing the two stokers. When we came to examine the remains, we found that they had been wrapped in a smoke cover. The largest pieces were those which were found sticking to the walls and floor about the place of disaster, and which had been collected, together with various-sized pieces of clothes, wood and iron, the smashed pieces of the bodies being found adhered to them. Parts of the bodies retained something of their original shape; e.g. the skull of the stoker, case 15, which was found severed at the upper part of the neck, with explosion-wounds on the face and loss of the lower jaw, while three other parts, that is, a left upper limb, and both lower limbs, were identified by all his comrades as belonging to the stoker, case 14. Of these limbs, the left upper limb retained everything below the lower end of the upper arm, except the middle finger below the second phalanx, and the whole of all the other fingers; the left lower limb which was found wearing a Japanese cotton sock retained the whole part below the upper end of the leg; the right lower limb had nearly as much preserved. The bone was broken in an irregular shape, and the muscles and tendons were torn off as if by violence, hanging down in shreds of irregular length from the severed surface. The face of the skull of the case 15 presented a black colour owing to the explosion wounds and the powder-grains sticking in it.

16. Smashing of the Whole Body:—K. M., aged 24, an able seaman on the *Shikishima*. In the engagement fought in the neighbourhood of Okinoshima on May 27th, 1905, he was standing as carrier of ammunition by the 12-pounder ammunition hoist of the middle deck, when, at 3.20 p.m., a shell hit the lower part of the casemate of No. 6 6-in. gun and exploded. He was struck by fragments of the shell and killed. On examination, the head and face were found destroyed out of all shape; the neck, chest, and shoulders had each a little part that remained undestroyed; the abdominal region and the upper and lower

limbs had been torn to pieces, and remained as mere fragments of flesh and bone. It was only by the badge attached to the garments that the remains were identified.

17. Explosion-Wounds of the Face and Fingers; Contused Wounds of the Left Zygomatic Portion; Penetrating Wounds of the Right Thoracic Cavity attended by Fractures of the 5th and 6th Ribs; Contused Wound of the Right Chest; Contused Wounds of the Right Forearm; Comminuted Fracture of the Clavicle and Scapula attended by Extensive Loss of Soft Tissues of the Left Scapular Region; Contused Wounds of the Right Arm; Wound attended with Loss of Soft Tissues of the Right Thigh; Wound Attended with Loss of Soft Tissues of the Right Leg; Contused Wounds of the Left Thigh; Lacerated Wounds of the Left Thigh and Leg; Contused Wounds of the Back of the Right Foot attended by the Comminuted Fractures of the Middle and External Cuneiform Bones and the Astragalus:—S. M., aged 30, a paymaster, belonging to the Submarine Mining Corps attached to the Combined Fleet. At 6.15 p.m. on June 13th, 1904, a mechanical mine exploded accidentally on the upper deck of the *Taihoku Maru*. The force of the explosion broke through the ceiling of the paymaster's room located just under the place where the explosion occurred, and not only were the walls and furniture of the room damaged thereby, but the room was set on fire. He was in his room at the moment, and sustained serious injuries. He was then carried out of the room by the men, and given the first-aid, after which he was admitted to the *Saikio Maru*. On examination, he was found to have explosion-wounds on the exposed parts such as the face and fingers, which were covered with innumerable spots of a dark brown colour. These parts had also sustained burns here and there, with the epidermis stripped off and the hair burnt. The body was covered over with blood clots; the countenance aghast, the pulse fine, the respiration irregular, the voice hoarse, the limbs cold, and thirst intense—that is, the symptoms of collapse had set in.

The conditions of the wounds were as follows:—(a) In the left zygomatic region, there was a contused wound three cm. in length and 1 cm. in width, reaching the bone; (b) in the third intercostal space at 1 cm. inward of the mammary line, there was a wound aperture 2 cm. long and 1 cm. wide, which breaking the 5th and 6th ribs, took its course downward and inward, and perforating the thoracic wall, entered into the cavity of the chest, destroying the lower lobe of the right lung causing the air to escape from the wound at every respiratory movement; (c) in the region of the 8th rib, along the anterior axillary line of the right breast, there was a contused wound 2 cm. in length and 1 cm. in width; (d) at the upper one-third of the right forearm, there was a contused wound, 2.5 cm. long and 1 cm. wide, and one of the same size at the middle one-third of the same arm; (e) in the left scapular region was found a wound of an irregular form with loss of soft tissues 13 cm. in length and 11 cm. in width, which left

bare the head of the humerus, and formed a deep cavity, comminuting the outer end of the clavicle, the suprascapular portion of the scapula, and the spine of the same bone, (*f*) at the posterior aspect of the upper one-third of the right forearm was a contused wound 2.5 cm. long and 2 cm. wide; (*g*) at the middle part of the inner surface of the right thigh existed a large wound with loss of soft tissues, 17 cm. long and 15 cm. wide, at the bottom of which were exposed the remains of the lacerated muscles, vessels, and nerves; (*h*) at the middle part of the external surface of the right leg, there was a wound with loss of tissues, 9 cm. long and 7 cm. wide, the remains of the destroyed muscles and tendons, being exposed at the bottom of the wound; (*i*) at the upper one-third of the anterior surface of the left thigh, was a contused wound 5 cm. in length and 3 cm. in width; (*j*) the articular surface of the lower extremity of the left femur and the upper two-thirds of the tibia and fibula were found comminuted, and the soft part from the knee-joint to the ankle was so heavily destroyed, that the greatest part of it was lost, only a thin flap of skin remaining on the posterior side connecting the severed extremities; (*k*) on the outer side of the posterior half of the dorsum of the left foot, there was a contused wound 9 cm. long and 7.5 cm. wide, and at the bottom of the wound could be seen the middle and external cuneiform bones and the astragalus comminuted, the wound thus reaching the metatarso-phalangeal articulation; (*l*) besides the wounds mentioned above, there existed in various parts of the body, innumerable small contused wounds of the nature of explosion-wounds. Now, all of the wounds mentioned above had an irregular margin, the bottom being rugged. The surface of each wound was dirty, with iron and wooden splinters, coal dust, residues of gunpowder, small bits of paper or cloth, etc., sticking to it, and attended by a tolerable amount of bleeding. After extracting the foreign bodies, the broken tissues were removed. The left lower limb was amputated at the part just above the knee-joint, and the wounds being well disinfected inside and out, antiseptic dressings were applied, followed by the hypodermic injection of saline solution and the internal use of brandy. Despite every means of relief duly given, the patient succumbed to his wounds at 8.10 p.m. of the same day.

18. Burns of the Head, Face, and Neck; an Abrased Wound on the Fore-Head; Contused Wound of the Cervical Region; Contused Wound of the Left Clavicular Region; Contusion and Contused Wounds of the Right Arm; Contused Wound of the Right Forearm; Blind Wound of the Right Breast; Explosion-Wounds of the Left Breast; Blind Wounds and Explosion-Wounds of the Left Upper Arm; Explosion-Wounds of the Left Forearm; Mutilation of the Right Arm; Wounds With Loss of Tissues of the Left Loins and the Hypogastric Region, accompanied by Fracture of the Ilium; Blind Wound of the Left Thigh; Burns and Explosion-Wounds of the Left Thigh; Explosion-Wounds of the Left Leg and the Dorsum of the Left Foot; Penetrating Wound of the Left 2nd Toe; Penetrating Wound of the Left

3rd Toe accompanied by a Comminuted Fracture of the 3rd Phalanx; Contused Wound of the Left 4th Toe; Explosion-Wounds of the Right Thigh and Leg; Rupture of the Right Tympanic Membrane; Concussion of the Brain:—S. K., aged 19, an able seaman on the *Itsukushima*. At the engagement off Lung-wan-tang on August 9th, 1904, he sustained wounds at 9.49 p.m., and on that day, was removed to the Hospital Ship *Kobe Maru*. On examination, he was found to be obscure in the mind and exhausted; temperature stood at 37.7°C., the pulse 78 beats, and the respiration counted 30 times. The conditions of wounds were as follows:—(a) the hair on the anterior half of the head, the eye-brows and lashes, were burned out; the conjunctivae were congested, but the eye-balls normal; (b) on the left forehead existed several abraded wounds of the size of a thumb-head; (c) on the left half of the face were found burns of the 1st or the 2nd degree, on the buccal region, lips, nose, and the pinna; the parts where the skin remained without being abraded presented a reddish-brown colour, while the left buccal region, deprived of its skin, had here and there small petechiae; (d) on the left side of the neck existed a burn, at the centre of which there was a contused wound of thumb-head size with a black scab sticking to it; (e) at a part about 1 cm. outside of the external canthus of the right eye was a burned surface 3 cm. in length and 1 cm. in width; (f) at the posterior and upper part of the left supra-clavicular fossa existed a contused wound about 3 cm. long running forward and backward, and in the skin of the external end of the left clavicular region was seen a contused wound 1.5 cm. in length. Each of these wounds was covered with a scab of a greyish-brown colour, with the margin swollen; (g) at the upper one-third of the external aspect of the right arm was found a contused wound some 7 cm. long, with a well-defined edge and running from the inside in a slanting line downward and outward. At the bottom of the wound a part of the deltoid muscle was found lacerated; (h) extending from the external aspect of the right arm and the middle of the anterior aspect of the same to the middle one-third of the corresponding aspects of the forearm, existed numerous lineated abraded wounds, which were extensively swollen, attended by subcutaneous extravasation of blood. On the interior side of the right forearm, just above the wrist-joint was an irregular contused wound of the size of a little finger-tip, which reached the fascia; (i) in the part corresponding in the right second rib, at about 4 cm. from the sternum was a wound of the size of a thumb-head. The wound perforating the pectoralis major reached the 2nd rib, and turning upward and outward got to the soft part. Inside the wound was found a very thin irregular-shaped iron fragment of the size of a sparrow's egg; (j) on the anterior aspect of the right chest

were wounds of the size of a bean or a hemp-seed and of a reddish-brown colour, with residues of gunpowder sticking in. The margins of the wounds were slightly flushed; (*k*) on the external and anterior aspect of the left arm, extending scatteringly from the upper to the lower extremity, there were numerous large or small abraded wounds, each of which had a black crust attached to it, and on the outer side of the same arm, just above the elbow-joint existed an aperture of a blind wound of the size of a little finger-tip, in which was found a bean-sized square iron-fragment; (*l*) on the back and outer sides of the left forearm, there were contused wounds of the size of a linseed or a millet-seed, each covered with a black crust. The left hand was entirely mutilated at the wrist and at the severed surface the flexor and extensor muscles and their tendons as well as the scaphoid, the semilunar, the cuneiform, the trapezium, the trapezoid, and the os magnum were found half-destroyed, and there were also found irregularly crushed skin flaps; (*m*) in the left lumbar region, there was an irregular-shaped wound with loss of soft tissues, about 15 cm. in length and 12 cm. in width, extending from the left hypochondriac region, to the part a little below the crest of the left ilium. The edge and bottom of the wound were markedly crushed; the surface, which was rugged and irregular, had minute black foreign bodies sticking to it. In the anterior part of the wound, the whole of the muscular layer of the abdominal wall, except a part of the fascia of the transversalis abdominis was lost, and in the other part of it a part of the small intestine and of the descending colon were seen bulging out of the wound by strain. In the posterior part of the wound, the lacerated external part of the latissimus dorsi and longissimus dorsi was destroyed; behind and above the wound there hung a palm-sized flap of skin contused and lacerated, and above it was perceived the lower extremity of the left kidney, while below was found a comminuted fracture in the external lip of the ilium, which was some 7 cm. in length, with the highest part of the crest of the ilium for its centre. The hæmorrhage from the wound was very slight; (*n*) just below the inner end of the left Poupart's ligament was an aperture of a blind wound of the size of a pigeon's egg. The wound had its margin irregularly torn, and measured 4 cm. in depth, reaching the muscular layers, so that it formed a cavity; (*o*) on the anterior aspect of the left thigh, at 8 cm. below the anterior superior spinous process of the ilium was found an irregularly-round aperture of a blind wound of the size of the little finger-tip. This wound had a depth of about 7 cm. running backward, but probing discovered no foreign body in it; (*p*) over the area extending from the middle part of the inner side of the left thigh down to the same side of the knee-joint, there existed several abraded wounds, round or oblong in shape and

of the size of either a millet-seed, a linseed, a bean, or a finger-tip, and also numerous narrow abraded wounds of various length; the deepest ones reaching the subcutaneous tissues, and almost all covered with brown crusts. On the outer side of the thigh, extending from its middle below to the outside of the knee-joint, were found burns of the 2nd degree; (*g*) on the front and outer side of the left leg, extending from its upper extremity down to the lower end of its middle one-third, there were burns of the 2nd degree, and on the inner side, numerous abraded wounds of the size of a linseed or a bean; (*r*) in the area extending from the anterior aspect of the left ankle-joint to the middle of the inner half of the back of the foot, existed numerous abraded wounds of the size of a linseed or a bean; (*s*) the 2nd toe of the left foot had, on its outer and inner sides, the bean-sized aperture of a wound perforating the toe at the back of its first phalanx; this wound reached the periosteum without injuring the bone. The 3rd toe of the same foot had also, on its outer and inner sides, a bean-sized wound-aperture perforating the toe at the back of the first phalanx, and in this case the bone was found comminuted. Again, the 4th toe of the same foot sustained a bean-sized contused wound on the inner side of the 2nd phalanx. This however, was but skin deep. (*t*) Also, on the front and inner sides of the right thigh, there were numberless abraded wounds partaking of the nature of explosion-wounds, of the size either of a bean, a linseed, or a millet seed, or of a linear form, and all of them were covered with black crusts; (*u*) on the inner and outer sides of the right leg, extending from the upper part down to the upper part of the lower one-third, there were burns of the 2nd degree and numerous dotted abraded wounds. At the lower part on the posterior aspect of the same leg, was an irregular fusiform burn of the 2nd degree measuring 8 cm. in length. As regards treatment, each wound was cleared of the foreign bodies existing in it, and the surfaces and margins were wiped clean. Then it was aseptically dressed followed by hypodermic injection of the saline solution. A part of the contused skin of the wound (*m*) was sutured, a sterilized tampon inserted, and the wound was dressed, but as the skin-flaps turned gangrenous, they were afterwards removed. After that, granulation though dull began to grow steadily on the wound, which consequently became markedly contracted and shallow. In one part of the wound, the fractured portion of the ilium became exposed, and many fragments of bone were extracted. When admitted to the hospital ship, the patient seemed drowsy and dull, and evinced heavy distress accompanied by groaning, but he grew easier six days later. The temperature oscillated between 38°C. and 39°C., the pulse was weak, counting 100 to 140 beats, the respiration ranged between 22 and 42. On the 17th following, the mind had returned almost to its normal condi-

tion: speech and responses became reliable, the temperature fell, the pulse was reduced to 94 beats, and the respiration to 24. On August 23rd, under the chloroform, amputation was performed at the middle one-third of the left forearm. As to wound (o), a counter-aperture was made at a distance of about 5 cm. outward and backward, through which the fragments of the first phalanx of the 3rd toe were extracted, and the soft tissues removed. All the minor wounds healed as the days went on, but the bodily strength remained impaired. The patient was removed to the Sasebo Naval Hospital on September 20th. On examination at the hospital, he was found to be seriously impaired in nutrition, and anæmic; indeed, mere skin and bone. He had over the body twelve large and small granulating wounds and numerous small scars. The wound with loss of soft tissues in the left lumbar region, extended from the 10th rib to the anterior superior spinous process of the ilium, and measured 17.5 cm. in length by 6.5 cm. in width at the upper part, 5 cm. at the middle, and 7 cm. at the lower part. At the lower extremity of the wound we perceived the fracture of the ilium, but the viscera of the abdomen were not exposed. There were also found a blind wound with unfavourable granulation at Scarpa's triangle, a perforating wound passing from the front and upper part of the thigh to the outer and lower part of the tuberosity of the ischium, four unfavourably granulating surfaces of the size of the little finger-tip on the front side of the left thigh, and two bean-sized surfaces of a similar nature on the front side of the left leg. On the back of the 1st phalanx of the 3rd toe of the left foot, there existed a compound fracture, with the soft tissues lacerated and a granulating surface $\frac{1}{2}$ cm. long on the front side of the 1st phalanx of the left 2nd toe. In the 2nd intercostal region, and at the front and upper part of the left upper arm, were found granulating areas of a relaxed nature, and on the sutured margin of the amputated end of the left forearm, a narrow, granulating area. The lower extremity of the left upper arm and of the right forearm had each a granulating surface, one of the size of the little finger-tip, and the other of the size of the thumb-head. After treatment, each wound gradually improved in granulation, so that almost all the wounds were healing; but as to the wound of the left lumbar region, it had crethistic granulation and was discharging pus; the temperature rose at intervals, attended by occasional attacks of gastralgia. On October 6th, the patient was transferred to the Kure Naval Hospital. At that time, there still existed nine granulating surfaces of various sizes. Under proper treatment, by the end of November, all the wounds but that in the left lumbar region had been cured. The latter, although remarkably contracted at this time, had adhered to the bone and was partly im-

movable. Its granulation was sluggish. So, on the 27th January, 1905, the cicatrices around the ulcer were cut off, and the tension of the wound was relaxed by making an incision through the skin behind and below it, and the skin-grafting performed on the granulating surface. After this, the wounds began to take a favourable course, and on March 29th a complete cicatrix was formed. In February, 1905, it was discovered that the left ear had a yellowish serous discharge. On examination, the external auditory meatus was recognized to be swollen, there existing a grain-sized rupture in the antero-inferior portion of the membrana tympani, but without any remarkable hindrance in hearing. It is probable that the injury was inflicted at the same moment as the other wounds. The patient gradually recovered his appetite: all his serious wounds were healed, and he was fortunately saved from death. He had, however, lost the left forearm below its middle one-third, the trunk of the body had become drawn to the right side owing to the cicatrix formed in the left lumbar region, and in consequence of the contraction of the left 2nd toe he was seriously hindered in the performance of various acts. Therefore, he was dismissed from service and left hospital on May 31st, 1905. The days' treatment numbered 296.

19. Burns of the Face and Neck; Contused Wound of the Left Leg; Abrased Wounds, Contused Wounds and Blind Wound Partaking of the Nature of Explosion-Wounds of the Left Upper Limb; Contused Wound of the Thoracic Wall; Contused Wound of the Left Foot, attended by Fracture of the Os Calcis; Contused Wound of the Left Great Toe; and Abrasions of the Left Foot:—J.B., aged 24, a first class stoker, belonging to the destroyer *Kasumi*; while participating in the capture of the *Ryeshitelni*, was wounded by an explosion of gun-cotton at 4.38 a.m. on August 12th, 1904. On examination, (a) the left half of the face had burns of the 2nd degree; eyebrows, eye-lashes, whiskers and mustaches were mostly burnt off and found sticking in fragments to the skin. On the left side of the neck extending from behind the left ear and the lower part of the lower jaw to the upper part of the sternum, there were burns of the 2nd degree, which were mostly covered with black powder; (b) in the left axilla, on the front and outer side of the left upper arm, on the back of the forearm and on the back of the hand on the same side, there existed innumerable abrasions of various sizes and of irregular shapes. At the middle of the upper one-third of the anterior aspect of the left upper arm, and at the middle of the back of the forearm on the same side, were found shallow contused wounds, the edges of which were slightly swollen. On the fore and outer side of the left forearm was discovered a small blind wound; (c) on the middle axillary line of the left breast, at the part corresponding to the 10th rib, there was a nut-sized tender swelling; (d) a shallow, oblong contused

wound as large as a child's palm was found running downward and inward from the lower border of the left patella. Another similar wound 5 cm. long took its course from the lower part of the tubercle of the tibia obliquely upward and inward. Both of these wounds had irregular margins, attended with slight hemorrhage, without involving the bone; (e) a fusiform contused wound with a regular margin was seen running from the part just below the left internal malleolus obliquely toward the tubercle of the os calcis. The anterior half of the wound was no deeper than the subcutaneous tissues, while at the middle of its posterior half there was a canal reaching the inner surface of the os calcis. The margins and the whole surface were covered with fine black foreign bodies, and the tubercle of the os calcis was found fractured from its back and upper part inward and downward; (f) on the plantar surface corresponding to the interphalangeal articulation of the left great toe, was a contused wound in a transverse position,



Fig. 1. The upper engraving shows the wooden splinter extracted from the wound (b) on the outer side of the front of the left upper arm. The one below shows the largest one of the many wooden fragments taken out of the left leg (d)—case 19. Both represent the actual size of the objects.

aseptic dressing were applied to the wounds. The wounds took a very favourable course, and the burns, abraded wounds, and small contused wounds healed within ten days. The existence of a foreign body being recognized in wound (b) an incision was made, on the 23rd following, in the front side of the left upper arm, and a wooden splinter (as shown in Fig. 1) 5 cm. long and 6 cm. wide was extracted from the opening. Previous to this, pieces of wool (refer to Fig. 1) and an iron fragment had also been taken out of the wound (d). Both of these wounds developed healthy granulations and were rapidly pursuing a very favourable course. On September 20th, the patient was transferred to the Sasebo Naval Hospital. At that time, the entire inner side of the left ankle-joint was swollen; at the lower part of the left internal malleolus existed a granulating surface of the size of the little finger-tip; part of the calcaneum was found defective leaving a depression 1 cm. in length, and on the front side of the left knee-joint and on the left upper arm were found numerous cicatrices.

which being skin-deep gave no fracture to the bone; (g) right before the left external malleolus, there was an irregular triangular abrasion of the size of the thumb-head, and on the inner edge of the sole of the left foot existed a contusion. The patient received first-aid on board the ship, and that same day was sent to the Hospital Ship *Kōbe Maru*. On board the ship, sterilized oil gauze and other

The face was found dotted over with black spots. Thanks to careful treatment after admission to the hospital, the remaining wounds had all formed cicatrices by the 28th following, and the impaired movement of the left ankle-joint was gradually restored by the application of hydrotherapeutics, massage, etc. The patient left hospital completely recovered, on October 15th, 1904. The number of days' sickness was 64.

While the man was serving in the Sasebo Naval Barracks after he had left the hospital, he found his left ankle-joint again swollen and painful. At his request, he was examined on October 20th, when the lower part of the left external malleolus was recognized to be swollen and tender. The treatment given, healed the lesion by November 18th. Then he was appointed to the Bako Secondary Naval Station on the 1st of December following. On the 27th of the same month, he applied to be examined again as the lesion had occurred, and in the course of treatment, traces were found of a fluctuation behind the internal malleolus. On January 28th, 1905, an opening was made and the wound made complete union before the 18th of February. However, as he complained of pain in the part in walking, he was sent, on March 14th, to the Sasebo Naval Hospital, where he arrived and was admitted on the 23rd following. At that time, the left ankle-joint was found a little swollen, attended by pain which would aggravate by walking, so that he was seen to walk with difficulty by treading, as far as the left foot was concerned, on the outer side of the foot. By application of wet carbolic acid dressing, foot bath, massage, etc., he began steadily convalescing, and all symptoms having abated by the beginning of May, 1905, he left the hospital on the 10th of the same month completely cured. The course took 202 days, and the days spent in hospital numbered 48.

20. Explosion-Wounds on the Face, Left Forearm, Left Leg, Right Leg, and the Dorsum of the Right and Left Feet; Blind Wound of the Right Hand attended by Fracture of the 4th and 5th Metacarpal Bones; Wound with Loss of Soft Tissues of the Left Leg, accompanied by Fracture of the Fibula; Blind Wound of the Left Leg; Contused Wounds on the Dorsal Side of the Right Foot attended by Fracture of the First Metatarsus; Mutilation of the End Phalanx of the Left Great Toe; Contused Wound of the Left 2nd Toe with Fracture of the 1st and 2nd Phalanges; Contused Wounds of the Left 3rd, 4th, and 5th Phalanges; Blind Wounds of the Right Leg; Contused Wound of the Dorsum of the Right Foot; Blind Wound of the Dorsum of the Right Foot attended by Fracture of the 1st Metatarsus; Blind Wound of the Right Great Toe; and Contused Wound of the Sole of the Right Foot:—T. M., aged 23, a leading seaman belonging to the *Maya*; on September 14th, 1904, charged with the duty of laying mechanical mines with other comrades, was on board the vedette-boat of the *Mikasa* making for the entrance of Port Arthur. Having laid the mines, the party was about to start back, and

he was at work on the port side amid-ships, when at about 3.30 a.m. a large calibre shell hit the deck in the neighbourhood of the fore 47-mm. quick-firing gun, which exploded.

He sustained severe injuries and was sent on board the *Chokai* and at Dalny he was admitted to the *Kobe Maru*. At that time, he was found to have (a) the right and left external auditory canals congested in their deep part and the membrana tympani clouded; (b) in the left half of the face and on the left forearm, abraded wounds of the size of a linseed, a pin-head, or a bean, caused by burning gunpowder striking against the said parts; (c) an irregular triangular, flap wound, 5 cm. in length and 4 cm. in width, which extended from the palmar side of the right wrist-joint to the palm, the tendons of the flexor muscles, the palm, and the sheaths of the tendons being torn off. There was a canal down the middle of the wound, which smashing through the base of the 4th and 5th metacarpal bones reached the subcutaneous part of the back of the hand; (d) an irregular triangular wound with loss of soft tissues extending from the upper part of the lower one-third on the front and outer side of the left leg to the part just below the ankle-joint. The bottom of the wound was found to be rugged and uneven, with small foreign bodies attached. The sheaths of the tendons of the anterior tibial muscles were destroyed, and the periosteum on the outer side of the tibia stripped off. The fibula was found broken into several fragments at a part some 5 cm. above the external malleolus; the margin, which was considerably crushed, had foreign bodies of a black colour adhering to it. Again, in the inner side of the upper part of the lower one-third on the posterior side of the left leg, there existed a wound aperture irregularly oval in shape and of the size of a walnut, which pierced the gastrocnemius muscle and ran obliquely downward and forward until it reached the fractured part of the fibula mentioned above. Above and below the two wounds named last, there were numerous explosion-wounds of the size of either a linseed, a bean, or a finger-head and with gunpowder penetrating into them; (e) the end phalanx of the left great toe was found mutilated; in the inner side of the left foot corresponding to the first metatarsus, there was a flap wound 5 cm. long, which extended from the back of the foot to the sole, and communicated with the metatarso-phalangeal joint of the first metatarsus, the head of the latter and a part of the first phalanx of the great toe being comminuted. In the inner and outer sides of the back of the left 2nd toe, there was a contused wound, which had comminuted the distal extremity of the 1st phalanx and the base of the 2nd phalanx, at the bottom of which were sticking some fine pieces of cloth and some other foreign bodies of a black colour. The 3rd toe on the same side had a contused wound

extending from the inner side of the base of the 2nd phalanx to the plantar surface of the apex of the end phalanx; also another contused wound transversal in position and 2 cm. in length was found on the plantar side of the 1st phalanx. The 4th and 5th toes had each a small contused wound on its back, which was found to be dirty by reason of foreign bodies adhering; (*f*) in the lower one-third of the right leg existed a small finger-tip-sized aperture of a blind wound and a couple of bean-sized apertures of blind wounds on the front side of the tibia, which reached to the surface of the bone and contained fine pieces of cloth and other foreign bodies. On the front and outer side in the middle one-third of the same leg was found a bean-sized aperture of a blind wound, and in the upper part of the lower one-third on the inner side of the same leg existed blind wounds with apertures, the size of a linseed or a bean; in the middle part of the lower one-third of the same was a linseed-sized aperture of a blind wound. These wounds mentioned above were each 2 cm. in depth, and had around them numerous small contused wounds or abraded wounds of an irregular shape. Their surfaces were dotted over with gunpowder, or covered with crusts, each forming a shallow ulcer of the size of a 50-sen* silver coin; (*g*) in the back of the right foot, corresponding to the middle of the 4th and 5th metatarsi, there was a contused wound, 3 cm. in length, which ran from the inner and upper part obliquely downward and outward. Extending from the middle of the same foot to its inner side, there were numerous contused wounds of the size of a bean or a linseed, and 3 blind wounds with apertures, the size of a linseed. In the inner side of the same foot, at the part corresponding to the metatarso-phalangeal joint of the great toe, was found a wound aperture of the size of a broad bean, which running obliquely upwards reached the middle of the 1st metatarsus, where it presented a comminuted fracture, the metatarso-phalangeal joint being heavily injured. On the inner side of the 1st phalanx of the right great toe was a wound aperture about 1 cm. long, which reached the subcutaneous portion of the outer side. On the sole of the right foot 3 cm. backwards from the base of the 2nd and 3rd toes, existed a flap wound of a crescent-form, some 6 cm. in length. The contused wounds, blind wounds, and abraded wounds enumerated above had many fine foreign bodies adhering to their surfaces, which were in consequence very dirty. To (*e*) wound in the back of the hand was given an incision, by which a shell-fragment was extracted; as to (*e*) wounds, the toes were amputated at the metatarso-phalangeal joint, and from (*f*) and (*g*) wounds were removed shell-fragments and other foreign bodies. On September 20th, the patient was transferred to the Sasebo Naval Hospital. At that time, the back of each foot was heavily swollen; the tips of the left toes were gangrenous, general anemia had set in; the temperature fluctuated between 38.5°

* A 50-sen silver coin has a diameter of about 2.7 cm.



H. K. ABLE SEAMAN. NAVAL HEAVY GUN BRIGADE. CONTUSED WOUND OF THE LEFT EYE; PENETRATING WOUND WITH FRACTURE OF THE RIGHT ELBOW; BLIND WOUND IN THE RIGHT THIGH; PENETRATING WOUND OF THE KNEE, WITH FRACTURE. (21.)

and 39° C., and each wound discharged more or less pus. As there was no hope of preserving the left leg, it was amputated at the upper one-third. The skin of the amputation stump having fallen into gangrene, the part was left open for treatment. On each side (inner and outer) of the back of the right foot a fistula formed, from which pus escaped copiously. At the beginning of October, the temperature gradually fell, and with the improvement of nutrition, favourable symptoms began to appear; almost all the wounds gradually formed cicatrices and were cured. The amputation stump of the left leg was ultimately healed on December 1st. The patient was then transferred to the Maidzuru Naval Hospital. At that time, the cicatrices of the wounds mentioned before, were still in existence, and at the back of the right foot, two fistulae were discovered. The treatment indicated for such cases was given, but the fistulae remained unhealed for a long time. Incisions were accordingly performed several times to inspect the interior of the wound, but no cause could be ascertained, though the pus continued to escape incessantly in slight quantities. However, on April 13th, 1905, the fistulae closed finally of their own accord and no abnormality has occurred since then. The patient lost his left leg from below the upper one-third, and besides, the right foot got somewhat shortened, so that the toes, by reason of the contraction of the tendons of the extensor muscles, became turned up a little, the toes did not touch the ground at all, and the body had to be supported only by means of the sole of the foot. Indeed, the only one of the limbs which remained perfect was the left upper limb. So, on June 9th, 1905, he left hospital dismissed from the service. The number of days' treatment was 268.

21. Explosion-Wounds in the Face; Contused Wound of the Left Eye; Contusions of the Right and Left Eye-Lids; Ruptures of the Right and Left Tympanic Membranes; Blind Wound of the Right Elbow-Joint, attended by Fracture of the Humerus (Arthritis of the Right Elbow); Blind Wound of the Right Forearm; Contused Wounds of the Left Leg; Blind Wounds of the Right Thigh; Blind Wound of the Right Knee-Joint, accompanied by Fracture of the Femur (Arthritis of the Right Knee):—H. K., aged 25, an able seaman belonging to the Naval Heavy Gun Brigade, was wounded by a hostile shell, while shelling the Russian ships in the harbour of Port Arthur from the west fortress at Huo-shih-ling, on October 25th, 1904. On examination, he was found to complain of serious distress in the chest and abdomen, and to be spitting blood in small quantities; the abdomen became distended attended by borborygmus, and feces containing blood were passed. The face had numerous small contused wounds caused by residues of gunpowder. Both eye-lids were œdematous, and the cornea of the left eye being ruptured, its contents were exposed. Behind the right elbow-joint existed a round contused wound 1 cm. in diameter, with fractured olecranon. In front of and just below the left knee-

joint was a contused wound of an irregularly triangular shape. Outside and below the left knee-joint was a wound of an irregular square form, 4 cm. in diameter; the capsular ligament was found injured, the joint dislocated, and the outer condyle of the femur partly exposed. Above and behind the last-mentioned wound, existed another irregular square-shaped aperture of a wound 4 cm. in diameter and of a subcutaneous depth, in which were lodged many wooden splinters (see Fig. 2). Above this wound were found a few small contused wounds.



Fig. 2. One of the wooden splinters that injured the right thigh of the man—case 21. Actual size.

First-aid having been given on the spot, the patient was sent to the Army Stationary Hospital at Shan-kien-pao, and on November 2nd, was removed to the *Saikio Maru*. At that time, the face was pale, the strength gone, the system exhausted; the pulse fine and weak, and thirst intense. His wounds were (a) near the inner edge of the left cornea, a flap wound, 5 mm. in length, which took its course first from the outer and lower part towards inward and upward, and then inward and downward. The cornea presented a milk white colour and was uneven in surface; owing to the escape of the contents of the eye, the tension was considerably reduced, resulting in the loss of sight. The right upper and lower eye-lids, and bulbar conjunctiva had an extravasation of blood, but the eye-ball was found to have no abnormality; (b) in the antero-superior portion of the left tympanic membrane was found a rupture of the size of a millet-seed, and the right tympanic membrane, also, had a small pea-sized rupture in the antero-inferior portion. Both of these ruptures discharged pus; the hearing by the watch test was 0/200; with Rinne's experiment, the left ear had the positive result and the right, the negative; (c) in the back of the right elbow, somewhat to the inward side, there was a wound entering the joint to a depth of 5 cm., which discharged thin pus; and in the bottom of the wound, the inner margin of the olecranon process was found comminuted. To the outward of the above wound we discovered a wound aperture of the size of a pea, which passing between the muscles on the back of the forearm entered downward to a depth of 12 cm. At the bottom was lodged a small shell-fragment, with small bits of cloth adhering along the course of the wound. Signs of arthritis of the right elbow-joint existed; (d) in the part corresponding to the interior margin of the left patella was an irregular triangular contused wound 3 cm. in length, which entered 2 cm. upward and backward; at the bottom of the wound the broken pieces of the inferior margin of the patella were tangible. Over the tuberosity of the left tibia was found a granulating area 3 cm. in length and 2.5 cm. in width; (e) at the middle one-third on the anterior side

of the right thigh, there existed a wound aperture 3 cm. long and 2 cm. wide, which had a depth of 10 cm. upward; and at the lower one-third on the outer side of the same thigh was another aperture of the size of a broad bean, which communicated with the former subcutaneously. Some 2 cm. above and behind the last wound, we found a wound aperture of the size of the thumb-head, which taking courses, one upwards and one downwards, to a depth of 4 cm. gave us, at the bottom of each course, two woollen fragments. All the wounds enumerated above were found heavily inflamed and suppurating within, the inflammation extending to the surrounding part; (*f*) behind and outside the right knee-joint was found an irregularly-round wound with loss of soft tissues 4 cm. in length and 3 cm. in width, which had a depth of 5 cm. upward; in front and outside of the same joint, there was an irregular, round and uneven wound, 5 cm. in length and 4 cm. in width, the bottom of which was found communicating with the cavity of the knee-joint. The external condyle of the femur was partly comminuted; the wound discharged serous pus in copious quantities, and the borders of the joint were generally swollen, this being especially the case with the upper and lower parts of the patella. From each of these wounds the foreign bodies were extracted, followed by the application of aseptic dressing. The inflammation of the various wounds of the upper and lower limbs subsequently aggravated, and pus came from them copiously; the temperature rose, and the debility increased day after day. With a view to this emergency, a free incision was given to each of the blind wounds of the knee-joint and of other parts. In consequence, the discharge of pus abated a little, but the healing process was found to be as dull as ever. The left eye-ball became atrophied and the orbit got depressed. From the rupture of tympanic membrane on either side less secretion was discharged, but the rupture still remained. The patient was removed to the Sasebo Naval Hospital, on December 1st. On examination at that time, he was found to have a spindle-shaped wound surface, with its apex downward, 13 cm. in length and 5 cm. in width, which extended from the region of the internal condyle of the right upper arm to the middle part of the posterior aspect of the forearm. Near the base of the above wound was an aperture of a wound 3.5 cm. in depth and reaching the bone, and in the neighbourhood of this, there were also two more wounds. The right elbow-joint was found ankylosed in a flexed position, and by help of the radiograph, a fracture of the olecranon was recognized. Extending from the upper one-third on the anterior and outer sides of the right thigh to the upper part of the lower leg, there was a wound 26 cm. in length and about 5 cm. in width. This wound measured 8 cm. in depth at its lower part, and communicating with the cavity of the knee-joint, copiously discharged pus, which

had an offensive smell. Behind the above, there was another wound 9 cm. in length, and the right lower leg was œdematous in general. Besides, there existed two wound surfaces of the size of the thumb-head at the anterior side of the left knee-joint. At the middle of the left leg was found a granulating surface of the size of the head of the index-finger, and the wounds of the left leg discharged a little pus. The debility of the body consequent on the suppurating inflammation of the right knee-joint was aggravating day by day. Accordingly, under the influence of a general anæsthetic, the right thigh was amputated at the lower extremity of its upper one-third part, on the 8th of December. Life was supported by means of injections of saline solution and the internal use of stimulants, and a greater part of the amputated locality healed by first intension in due time, and the temperature gradually fell. After the operation, a disorder of the stomach and intestine manifested itself, which, however, subsided in time. At the beginning of the next year, 1905, he got bed-sores on the sacral region, which, however, were cured with the gradual improvement of nutrition. The wound of the right elbow-joint was completely healed on April 15th, 1905. The left eye which was found slightly contused at the time when the wound was received, disappeared almost without trace, owing to the atrophy of its contents. On December 10th, he was fitted up with an artificial eye. Through treatment, the debility of the body gradually abated, but the right elbow-joint got ankylosed forming an angle of about 40°; the wrist-joint became partially ankylosed, and the movement of the fingers was also impaired. Nor could the left knee-joint be bent more than 40°; the rupture of both tympanic membranes remained without closing and prevented him from catching words spoken in ordinary tones. Further treatment was being given to the ankylosed limbs by application of massage, electricity, etc., when on June 8th, 1905, the patient was removed on board the *Saikio Maru*, to be transferred to the Yokosuka Naval Hospital, which he reached on the 13th following. At that time, the wounds of the right upper limb and of the right and left lower limbs were found already cured; the anterior half of the left tympanic membrane was clouded; and below its centre and around the apex of the handle of the malleus, there was a kidney-shaped rupture the size of a grain. Hearing indicated 0/200 by watch test. From the time of admission to the hospital, the nutrition gradually improved. In the course of two or three months, the tympanic membranes had their ruptures closed, but indistinctness still remained and cones of rays could not be well perceived. The left hip-joint and the knee-joint were gradually recovering their flexion, so much so that the patient could, without much difficulty, walk once around the room with the help of a crutch. From August, he was ordered to take daily walks about the hospital.

The impairment of hearing improved so much that he could understand others when they talk aloud. The watch test indicated 10/200 with the left ear. The right upper arm was emaciated in general, and the elbow-joint got ankylosed with a bent of about 70°; the left eye and the right lower limb were lost, and the right ear was entirely deprived of its function. The deprived eye and limb were replaced by the artificial ones, which Her Imperial Majesty had been graciously pleased to grant. He was discharged from service and left hospital, on June 13th, 1906. His course took 596 days to run. Refer to photograph (21).

22. Contused Wound of the Left Parietal Region, attended by Fracture of the Parietal Bone; Contused Wound of the Left Upper Arm; Contused Wound of the Right Forearm, attended by Fracture of Radius and Ulna; Perforating Wound of the Left Thigh; Blind Wound of the Right Thigh, accompanied by Fracture of the Femur:— K.A., aged 21, a 4th-class stoker on the *Kasuga*; during the battle off Okinoshima on May 27th, 1905, he was at work, as a member of the fire brigade, on the upper deck amidships, when at 2.33 p.m. a hostile shell hit that part of the ship and exploded. He was injured by some of the shell-fragments. On examination, he was found to have the following wounds; (*a*) in the anterior and inferior part of the left parietal region a thumb-head-sized contused wound, by which the external table of the parietal bone was comminuted and the internal table depressed towards the cranial cavity; (*b*) in the middle of the right upper arm a contused wound, 3 cm. in length and 2 cm. in width; (*c*) in the front side of the right forearm, a large crushed wound which ran from the inner side of the elbow-joint to the wrist, the radius and ulna being in consequence fractured at a several places; (*d*) in the anterior side of the left thigh and opposite the apex of Scarpa's triangle, a wound-opening 7 cm. in diameter, which was ascertained to communicate with another wound of the size of a goose-egg lying in the middle and outer side of the thigh; (*e*) at the part 8 cm. downward from the anterior superior spine of the right ilium, an aperture of a wound, some 7 cm. in length and 6 cm. in width,—the canal ran inward and backward, and had inserted in it a shell-fragment 16 cm. in length and 3 to 5 cm. in width and 496 gram. in weight; at the bottom of the wound was perceived the fractured part of the head of the femur. Circular amputation was performed at the part of the upper one-third of the right arm, and the other wounds were treated aseptically. Subsequently, on the 28th following, in the afternoon, the temperature registered 39.4° C., and the pulse was extremely fine and weak. On the 31st, he was removed to the Sasebo Naval Hospital. At that time, each wound discharged pus copiously. A few days after, the amputated stump, and the margin and bottom of the wound of the right thigh became gangrenous. The temperature

stayed high, nutrition grew remarkably impaired, and he was for a time in a very dangerous condition. The surface of the contused wound in the left parietal region, being comparatively clean, discharged a small amount of pus, and having been covered with granulations by June 15th, formed cicatrices on July 30th. As to the amputated stump of the right upper arm, incisions were made to its inner and outer sides, and drainage tubes were inserted into them; on the 18th of the same month another incision 3 cm. in depth was made on the posterior surface of the stump. As a result, the discharge of pus was much lessened, sloughs gradually came off, and the amputated end becoming elongated, the incised surfaces were closed save at the posterior side, and the part was completely cured on November 1st. The perforating wound of the left thigh progressed rather favourably; on June 22nd the communication between the entrance and the exit of the wound was found closed and the granulations grew even; by the middle of July, the one in the anterior side had shrunk to the size of a thumb-head, and the one in the posterior side to about 1.5 cm. in diameter. Thus both were healed toward the end of August. The blind wound of the right hip-joint was comparatively deep, and at the bottom was exposed the completely fractured head of the femur. Within the wound pus accumulated, and on the surface sloughs were found still adhering. On June 20th, under the general influence of anæsthetic, the capsular ligament was cut off, the head of the femur which had been obliquely fractured above the anterior intertrochanteric line, was extracted; a counter-opening was made at the middle of the right nates, into which a drainage tube was inserted, followed by the application of an aseptic bandage. The growth of granulation was, however, still very slow, attended by an incessant escape of pus, though in small quantities. The incision wound in gluteal region formed fistulae and seemed very slow in healing, but after the subsequent extraction of a sequestrum 1 cm. long from the incised part of the head of the femur on February 23rd, 1906, and of another 5 cm. long and 3 cm. wide on April 10th, the wound began to take a favourable course. On June 6th, healthy granulations were seen to be forming, and almost at the same time the operation wound of the gluteal region began to form cicatrices, so that the patient could walk by supporting himself with a cane. The cicatrices being perfectly formed, the wound healed at the middle of August of the same year. After the operation on the right hip-joint, the temperature fell a little; and on the curing of the wound of the right upper arm somewhere about December next, the nutritive conditions improved remarkably, and he was thus fortunately saved from death. However, he was disabled as he had lost his right upper arm below its upper one-third with the right lower limb shortened by 7.5



K. A. STOKER. KASUGA. RIGHT ARM AMPUTATED; PERFORATING
WOUND IN THE LEFT THIGH; BLIND WOUND WITH FRACTURE
OF THE RIGHT THIGH. (22.)



em., and with the hip-joint incapable to be bent over 90°, so that he could neither sit down close-legged nor walk. On September 14th, 1906, he put on the artificial arm graciously conferred upon him by Her Imperial Majesty and left the hospital. The days' sickness required was 475. Refer to the photograph (22).

SECTION IV. WOUNDS OF THE HEAD, FACE, AND NECK.

The total number of cases of deaths consequent on injuries of the head, face, and neck, which occurred during the late naval war was 153, of which 124 were cases killed on the spot, 21 cases of death some time after injury, and 8 cases of death at hospitals. Compared with the total number of cases of deaths caused by all other kinds of injury, the cases of instant death under consideration shows a ratio of 32.04 per cent., those of death some time after the infliction of injury a ratio of 17.54 per cent., and those of death at hospital a ratio of 17.02 per cent. The whole of the cases of the death under question bears a ratio of 29.92 per cent. to the total number of fatal injuries of all kinds. It is a fact that the injuries of the class under consideration have a larger proportion of instant deaths than those of any other part of the body. As far as the cases of death after infliction of injury and those of death at hospitals are concerned, they show a smaller proportion than the average of deaths consequent on injuries of other parts. Injuries of the head were compound fractures or penetrating wounds of the skull mostly attended by the smashing or destruction of the whole skull, or an injury of the brain, and about half the number of such injuries were also accompanied by mortal wounds of other parts. Perforating wounds occurred very seldom. This was to be expected, because shell-fragments do not possess the shape and force which make bullets favourable for penetration. A large shell-fragment may have a correspondingly strong force, but its unfavourable shape inclines it rather to give destructive pressure, and as to a small shell-fragment, it is naturally too feeble to penetrate deeply. The mortal injuries that hurt only the face or the neck numbered six each, and among other injuries of the face and neck, there were some attended by wounds of other parts of mortal character.

The cases of injuries of the head, face, or neck which resulted in cure numbered 609, excluding the cases invalided, and cases attended by serious wounds of

other parts, and cases of injury to the organs of hearing. This shows a ratio of 26.81 per cent., compared with 2,268 cases, which is the total number of all wounds recovered. The total number of wounds received in the face alone was 334, which shows that though the face has a comparatively small area, it yet ranks first among all parts of the body in the number of injuries received. This must be attributed to the fact that as the face is bare and devoid of all the coverings which give protection to the other part of the body, even a slight cause is apt to produce an injury. It may be said, that wounds received in naval battles vary much in the degrees of their severity, and this was even the case with injuries proceeding from the same cause but received on different parts of the body. For, the causes that will produce superficial and slight contused wounds or abraded wounds in the face or other exposed region are often too weak to inflict any injury to parts protected by clothing, etc.

We shall now make statements concerning 2 cases in which the head was completely smashed, 1 case each of compound fracture of the skull and of a penetrating wound in the skull caused by shrapnel, 1 instance each of motor aphasia and of hemianopsia, several instances of the encephalomalacia or cerebral abscess consequent on injuries received in the head (of which 2 cases occurred to Russians).

23. Mutilation of the Skull:—Lieutenant-Commander T. H., aged 35, Torpedo Officer of the *Asahi*. On March 27th, 1904, in charge of the blockship *Fukui Maru*, he dashed into the entrance of Port Arthur, and having blown up his ship, was about to retire in a boat with his men, when, missing a chief warrant officer he returned to the sinking ship and searched for him three times, but in vain. Meanwhile the sea-water rushing into the ship had risen to the upper deck, and the officer was compelled to leave the ship. He was standing in the boat returning to the fleet, when about 4.10 a.m. a shell struck him in the head and threw him overboard. Blood, and some cerebrospinal fluid was spattered over the caps, faces, and uniforms of his comrades, and a lump of flesh sticking to the compass was all that remained of him.

24. Mutilation of the Skull:—K. M., aged 24, a chief bandmaster on the *Mikasa*. During the battle fought off Port Arthur, on August 10th, 1904, he was stationed, as an ambulance man, to the right and aft of the main-mast and close by the inner wall of No. 15 casemate on the upper deck,

when at 1.36 p.m. a 12-in. shell entering by the port quarter obliquely struck through the shelter-deck, cowl, main-mast, etc., and exploded. Struck by some of the flying shell-fragments and by wooden and iron splinters, he was killed on the spot. As to the skull, all the region above the imaginary line drawn between the superciliary ridge and the occipital protuberance had both scalp and bones destroyed, so much so that the greater part of the cerebrum, cerebellum, and medulla oblongata had been knocked out, and the base of the cranium laid bare. Fissures were found in the pterygoid process of the sphenoid bone, attended by bleeding. The temporal bone retained the left squamous portion, but had lost the right one. The bone forming the margin of the wound was almost evenly broken all round as if sawed off horizontally, but the bone margin was covered with the severed ends of the scalp which hung loose.

25. Contused Wound of the Head, attended by Comminuted Fracture of the Parietal and the Occipital Bones; Perforating Wound of the Left Forearm, attended by Fracture of the Radius, and Blind Wound of the Right Thigh:—Y. T., aged 21, a



Fig. 3. The shell-fragment extracted out of the blind wound of the right thigh, with a piece of woollen cloth and some gelatinous substance of unknown nature adhering to one aspect. Actual size.

boy 1st class on the *Nisshin*. While the naval battle was going on in the neighbourhood of Okinoshima, on May 27th, 1905, he was sending a message at his post on the right side of the conning-tower on the fore upper-deck, when at 2.40 p.m. a hostile shell hit the right fore 8-inch gun. At that moment, he was struck by the shell-fragments and killed. On examination, he was found to have, (a) a contused wound 12 cm. long and 5 cm. wide extending from the right parietal region to the region of the left occipito-temporal suture.

The skull was broken radially, and the dura mater and the pia mater being also broken, the brain substance was found exuding. (b) At the lower extremity of the left forearm, there was a perforating wound. The opening of the wound on the back was an oval one 6 cm. in length and 2 cm. in width, and the front opening on the radial side was a flap one, 6 cm. long. In its course was perceived fracture of the radius. (c) Inside and above the right knee-joint was found a blind wound with an aperture the size of a hen's egg. In the wound was found a rough, lamellar, rhomboid shell-fragment 5 cm. in length, 2.5 cm. in width, 5 gram. in weight, which was covered with a torn piece of woollen cloth (See Fig. 3).

26. Penetrating Wound of the Left Temporal Region, attended by Fracture of the Bone; Contused Wound of the Face; Blind Wound of the Cervical Region; Con-

fusion of the Left Thoracic Region, accompanied by Simple Fractures of the 3rd and 4th ribs; Penetrating Wound of the Left Chest; Penetrating Wound of the Left Iliac Region, attended by Fracture of the Same Bone; Mutilation of the Left Upper Arm; Contused Wound of the Right Upper Arm; Blind Wounds of the Right Elbow-joint and Right Forearm; Blind Wound of the Left Thigh, attended by Fracture of the Femur:—

R. S., aged 22, an able seaman on the *Chokai*. While shelling the Russian position at Nan-shan on May 26th, 1904, he was engaged in conveyance of ammunition on the 12-cm. gun battery in the fore, when at 7 a.m. a hostile shell struck the fore gun deck and exploded, wounding him at several parts. On examination, there was found (a) the triangular opening of a penetrating wound in the left temporal region. The sides of the triangle were about 2 cm. long and the margin was contused and lacerated. The corresponding part of the temporal bone was fractured, involving the superficial part of the brain, in which was found imbedded a bullet of a shrapnel measuring 15 grammes (see Fig. 4). (b) At 1 cm. below the left angle of the mouth were a couple of small contused wounds. (c) At the middle of the belly of the left sternocleidomastoideus was found the opening of a wound 2 cm. fore and aft, 1 cm. up and down, with the margin contused and lacerated, having a depth of 2.5 cm.

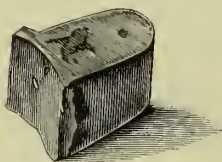


Fig. 4. A ball of shrapnel shell extracted from the wound of the left temporal region—case 26. Actual size.

forward and inward. (d) Just forward of the wound last mentioned, there was a wound somewhat round in shape, which had a depth of 3 cm. obliquely to the forward; at its bottom was a shell-fragment 18 gram. in weight. The wound (e) also had at its bottom another similar piece weighing 17 gram. (e) There was extensive subcutaneous extravasation of blood extending from the 2nd rib to the 4th rib in the front of the thorax, and the 3rd and 4th ribs had sustained simple fracture at a part 8 cm. to the

left from the left margin of the sternum. (f) In the 5th intercostal space on the left mammary line was found an oblong penetrating wound, having a length of 3 cm. and a width of 2 cm. and reaching the thoracic cavity. (g) At 5 cm. behind and above the anterior superior spine of the left ilium was an oval entrance wound, 7 cm. in length fore and aft, and 3 cm. up and down. This wound broke the crest of the ilium and piercing the pelvic cavity obliquely reached the skin of the perineum, where it retained a large shell-fragment 225 gram. in weight, though attended by comparatively little bleeding. (h) The left upper limb was found entirely crushed out of its original shape and presenting a dark-brown colour, except the part below the wrist-joint, and the hand scarcely held its connection with the arm, by means of narrow flap of skin and muscle. The brachial artery and vein were torn at the middle of the upper arm, causing

copious bleeding. (i) In the anterior surface of the right upper arm and in the muscular belly of the biceps, there was a contused wound of an oval shape, 4 cm. in length, 3 cm. in width at its base and 2 cm. in depth. (j) At 2 cm. below the middle on the anterior side of the right elbow-joint was an oval-shaped wound orifice 2 cm. longitudinally and 2.4 cm. transversally which taking its course downward and outward reached the surface of the radius and retained a bullet 21 gram. in weight. (k) In the ulnar side of the right forearm and 7.5 cm. below the internal condyle of the humerus was found an oval wound, 2 cm. in length and 1.5 cm. in width, which piercing the soft tissues reached beneath the skin at 6 cm. above the styloid process of the ulna, where was lodged a bullet 21 gram. in weight. (l) At the part corresponding to the neck of the left femur was an oval wound opening placed in a longitudinal position and 6 cm. longitudinally and 4 cm. transversally. The margin of the wound presented a brownish blue colour; and the femur appeared to have been fractured at the upper one-third; the bleeding was copious. The blood vessels were ligatured, and the bleeding, issuing from a deep part, was checked by compression, followed by aseptic bandages, and the hypodermic injection of camphor. In spite of all this treatment, the mind was obscure, speaking extremely confused, heart sound very faint; pulse fine and thread-like, and respiration almost imperceptible. The patient succumbed to his wounds at 8.51 a.m. on that same day.

27. Penetrating Wound of the Left Temporal Region:—K. M., aged 20, a 3rd-class stoker, belonging to the *Idzumo*. During the naval battle of Ulsan on August 14th, 1904, he was posted as an ammunition carrier, when at 7.40 a.m. a shell from the enemy, piercing the port side of the ship at the 2nd compartment of the main deck, entered the master-at-arm's office and exploded. On this occasion, he was wounded by a shell-fragment, felt pains in the head, attended by copious hæmorrhage. At 8.10 a.m. the same morning, he came himself to the dressing station to be examined, and on inspection, he was found to have a wound in the left temporal region, inflicted by a fragment which had struck the said part after piercing the thick woollen cloth forming the margin of his cap. From the opening of the wound was extracted a fragment of copper ring 2.2 cm. long, 1.9 cm. wide, 4 cm. thick, and 7 gram. in weight (see Fig. 5), and a suture was given to the

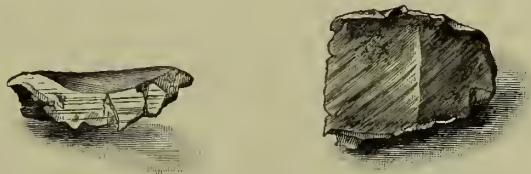


Fig. 5. A fragment of the copper ring extracted from the wound of the stoker's scalp—case 27. The right represents the plane, and the left, the lateral plan. Actual size.

skin-wound. The patient was, on the next day, sent to the Sasebo Naval Hospital. On examination at the hospital, he was found to have a contused wound to which suture had already been applied. The wound was 3 cm. in length and was located transversally in the left temporal region at a place 5 cm. from the highest part of the auricle. Antiseptic dressing was now applied to the part. Signs of suppuration presented themselves on the 22nd of the same month, so the sutures being removed, the interior of the wound was closely examined, by which it was ascertained that the outer and inner tables of the temporal bone were comminuted, and though the margin of the wound to the bone did not present any cracked fracture, yet a probe could be introduced into the cranial cavity through the breach. A small piece of woollen cloth was extracted from the wound. After that, the inside of the wound was cleaned every day, followed by the application of antiseptic dressing. Subsequently, on the 31st of the same month, at 4.45 a.m., a convulsive fit came on quite suddenly: the patient was just then reading, when he grew so dizzy, that he could not see any of the objects about him; the book dropped from his hands and he was found unconsciously pulling at his sleeves by the elbow, and convulsions came on extending from the upper limbs to the lower. The paroxysm after lasting for some minutes, passed nearly away; then the patient cried aloud for pain, sang madly, and recklessly beat any one standing by him. The bystanders tried to restrain him, but this only made him behave the more wildly, to their no small distress. Both pupils were rather dilated, and the pulse was frequent and irregular. After continuing in this condition for about 20 minutes, he recovered his normal mental condition. Chloral hydrate and bromide of potassium were now prescribed for internal use, together with the application of an ice-bag to the head, and an enema. The mouth of the wound gradually became smaller and smaller and was perfectly closed on September 10th; and the epileptic fit did not occur again. The patient left the hospital completely cured on October 2nd. His case ran its course in 49 days.

After leaving the Sasebo Naval Hospital, he served in the Sasebo Naval Barracks. While he was at home on leave, on December 16th, 1905, he suddenly fell unconscious, and passed three days in a comatose condition. Even after he came to himself, he conducted himself madly, sometimes falling into melancholy and sleeplessness, and it was said that he occasionally abstained from taking food. On January 2nd, 1906, he returned to the Barracks under the protection of his father and brother. At that time, his face was much emaciated, with the pupils of his eyes rather dilated and dull in reaction. Though his hearing was normal, he was slow in his replies; he was always gloomy, complained of headache and insomnia, and walked unsteadily. It sometimes happened that he would turn out

of his bed at midnight, and wander out-of-doors. On January 3rd, he was again admitted into the hospital, where every means of treatment proving inefficacious, he fell gradually into a comatose condition and expired at 6.50 a.m. on March 5th following. He had stayed in the hospital for 61 days.

At 1.30 p.m. on the day of his death, autopsy was held on him at the Sasebo Naval Hospital. By this it was ascertained that the scalp had a scar at a place 2.5 cm. right below the line of the superior temporal ridge of the left parietal bone. The skin of that part which was found adhering to the outer table of the bone by means of a cicatricial chord about 1 mm. in thickness came off quite easily. A fresh bone tissue had already developed round the wounded part and presented a depression of the size of a pea. At the end of the Sylvian fissure and at the posterior end of the temporo-sphenoidal convolution, there was a cohesion of the dura mater with the pia mater, which communicated with the cicatrix outside the skull, yet the dura mater was found to be sound in every other part. The arachnoid membrane presented a slightly white opacity; the cerebro-spinal fluid was abundant; on the surface of the dura mater in the left, anterior, and middle cranial fossae, were found yellowish-brown spots; and on the upper part of the tentorium and on the dura mater belonging to the occipital lobe, faint spots of a yellowish-brown colour. The arachnoid membrane was slightly opaque at the base of the brain and at the Sylvian fissure, and the transparent fluid in the lateral ventricle of the left brain existed in somewhat larger quantities than usual. Between the right and left optic thalami in the 3rd ventricle, there was a yellowish cloud fluid, and at the middle part of the left optic thalamus facing the 3rd ventricle we recognized a focus of cerebral softening of the size of a small finger head. Besides the abnormalities mentioned above, no derangement was perceived anywhere, excepting the engorgement of the ileum and liver, and accumulation of bile.

28. Contused Wound of the Left Temporal Region, accompanied by Fracture of the Temporal Bone; Blind Wound of the Left Parietal Region; Contused Wound of the Left Scapular Region; Contusion and Contused Wound of the Left Upper Arm:—B.A., aged 25, a barber on the *Chinyen*. During the battle of the Yellow Sea on August 10th, 1904, he was stationed, as an ambulance man, behind the conning-tower of the upper deck, when at 7.50 p.m. he was wounded by fragments of a hostile shell. On examination, (a) there was found a contused wound 3 cm. in length and 1.5 cm. in width



Fig.6. An iron fragment extracted out of the wound of the barber's head case 28; the upper shows the plane, the lower the lateral plan. Actual size.

in the left temporal region; the margins of the wound were sharp, indicating a probability of the temporal bone being fractured. Examination was made by means of an incision into the scalp upward from the anterior end of the wound, and downward from the posterior end of the same. The outer and inner tables of the bone were found comminuted, causing a depression 3.5 cm. long and 2 cm. wide; below it there was lodged a shell-fragment, a corner of which protruded from the wound.

The fragment on being extracted proved to be 1.7 cm. in length and 1.2 cm. in width (see Fig. 6). Examination then being made into the cranial cavity, it was found that some of the broken pieces of bone had sunk into and injured the brain substance. These were taken out with a piece of brain substance. Then the interior of the wound was wiped clean, followed by strict aseptic measures, and the margins of the wound being joined, suture was applied to the part. (b) Behind and median of the parietal eminence existed a small pea-sized blind wound 1.5 cm. in depth. Through another incision then made, a couple of small flat shell-fragments were extracted, and suture was applied to the part. (c) At 4 cm. to the left of and above the external occipital protuberance was a rice-grain-sized aperture of a blind wound, from which, through an incision performed longitudinally, was extracted a flat, thin shell-fragment: behind this wound, there was another blind wound with an aperture of the size of a millet-grain, but no injury to the bone was recognized in either (b) or (c). (d) In the region of the left acromion process, and running from the front obliquely backward and inward, there was a contused wound 5 cm. long, 2 cm. wide, and reaching the muscle. Suture was applied to it. Inward of this wound was a contused wound 3 cm. in length and 2 cm. in width, reaching the subcutaneous tissue. (e) At the middle on the posterior side of the left upper arm was a wound-opening 2 cm. in length and 1 cm. in width, which reached a depth of 2 cm., running beneath the skin; and at the middle one-third of the same was seen a palm-sized ecchymosed area. The patient presented an idiotic countenance, lacked sound sleep, complained of pain in the anterior cervical region, and had signs of motor aphasia. On the 14th following, he was removed to the *Kobe Maru*, where on the 10th next, the sutures of wound (a), that is, the compound fracture of the temporal bone, as also of (b) and (c), were removed. These wounds all healed by first intention, and all other wounds, taking favourable courses, were perfectly healed by September 1st. However, the face still retained the idiotic expression and it seemed very difficult for him to give facial expression to his thoughts. On September 20th, he was transferred to the Sasebo Naval Hospital. At that time, right below the cicatrix in the left tem-

poral region there was found a patch deprived of bone, the size of a 5-*rin** copper-coin. The patient had great difficulty in talking; he had to strive very hard to express his own thoughts. In so doing, his face would flush, headache and giddiness would come on, and his talking would get more and more confused as he went on. At the same time, he was affected with paraphasia: he made errors in words, or in their order, or put in useless words; yet, the centre of notions remaining healthy in him, he was able to perceive his own errors. The impediments were, after repeated training, remedied to a certain extent, but he was still unable to repeat expressions used by others, or to read books aloud; and it was difficult for others to catch the point of what he wrote. The patient was conscious of this fact, and any writing of his, corrected by others and shown him, he would acknowledge to be now correct; counting also was very hard for him. Besides the aphasia, he complained of headache in the part extending from the left temporal region to the parietal. The conjunctivae of both eyes were congested. No disturbance was recognized either in the sensation, the motor, or the reflex action. As for treatment, iodide of potassium was prescribed for internal use, and he was put to exercises in speaking, writing, and counting correctly. On October 27th, he was transferred to the Yokosuka Naval Hospital. On examination there, it took him an unusually long time to express the name of any object which was shown him. For instance, when a razor was shown him, he could not tell its name. When the examiner told it him, he looked relieved and very glad, and as if to fix it on his memory, he repeated the name several times. But he could not repeat it the next day. This was a characteristic symptom of amnesic aphasia, and yet he was able to transcribe, though with difficulty. Under due treatment, the pain in the cicatrised portion disappeared about the beginning of December, and speaking seemed to have become a little easier to him. His wounds having completely healed, he left hospital on January 18th, 1905, though in a mental state unfit for engaging in any kind of occupation. The days' sickness was 161 days.

29. Penetrating Wound of the Left Parieto-occipital Region, attended by Hemianopia:—J.W., aged 41, a chief yeoman of signals belonging to the *Fuso*:—He was engaged at the signal station at Namako-yama on November 30th, 1904, in observing the movements of hostile vessels in Port Arthur, when at about 11 a.m. he was injured by a shrapnel-bullet. He was examined at the Army Field Hospital at Fan-kia-tun. He had in the left lambdoid suture a wound-opening of the size of a bean, through which a pea-sized cortex of the brain was seen protruding; under the skin around the wound, there was hæmatoma, and the sight was much impaired. The wound was now dressed with a

* A 5-*rin* copper coin has a diameter of about 2.2 cm.

sterilized dry dressing; and the patient was received at the dressing station at Huo-shih-ling on December 1st. When examined there, he was quite sound in mind, though rather slow in speaking and answering. After disinfecting the margin of the wound, a longitudinal incision 3.5 cm. long was made in the scalp, at the part 5 cm. below the wound, and a shell-fragment tangible beneath the skin was extracted. Then the surface of the wound was wiped clean, followed by the application of an aseptic dressing, and the patient was ordered to take rest. On the following day (2nd of December) he was sent to the *Kobe Maru*. On examination there, he was found to have a tolerably good constitution, with somewhat impaired nutrition and a slightly obscured mind. He had a headache, which he complained of as being severe especially on the left side, and he had occasional attacks of lightning pain extending from the occipital region to the left temple. Neither sensory nor motor disturbance of the upper and lower limbs was perceptible. The pupils were of equal size on both sides, and of normal reaction. The right eye had lost its vision in the nasal half of its visual field, but in the temporal half he was able to count fingers: as to the left eye, he could count the number of fingers held up at a distance of about 30 cm. from the eye on the nasal half of the visual field, and was totally blind on the temporal half. The inspection of the wounded part showed that the portion behind and above the left parietal eminence was evenly swollen to the size of the palm of a hand, and in front of it, taking its course slightly backwards and downwards, there existed an irregularly round wound 2 cm. in diameter. Its margin was inflamed and presented a dark-red colour, giving intense pain on pressure. A probe introduced into the wound reached to a depth of about 6 cm. backwards, the rough margin of the bone being tangible at some 3 cm. from the opening of the wound. Beyond this point, the probe, so we felt, seemed to touch the soft covering of the brain, or the brain substance itself. Again, at some 4 cm. downward and backward of the last wound, there was a longitudinal incision wound 3 cm. in length, which communicated with the above-mentioned wound beneath the aponeurosis. Besides, in the palm-sized area behind and above the left parietal eminence, pain was caused by pressure, but, in spite of a swelling, there was no alteration in the colour of the skin. A slight pressure of the finger on this spot, which was pliable, left its mark. The hair around the wound was now shaved off, and the wound surface cleaned; out of it were extracted pieces of cloth, one the size of the small-finger tip, another the size of a pea, and one more of a very small size; also fragments of bone, hair, another foreign bodies. On the 5th following, under the general anesthetization, an incision was made from behind and above the left parietal eminence obliquely

crossing the opening of the wound backwards and downwards. Then the periosteum was stripped off, and the bottom of the wound inspected, when it was found that there existed in the parietal bone, at about 4 cm. behind the left parietal eminence, a fracture attended by an irregularly round depression of the size of the thumb-head; with a turbid fluid oozing out through cracks in the margin. Hereupon, the bone was trephined off from the margin of the fracture, and all hair, cloth pieces, etc., found adhering to the fractured part were extracted, and the collapsing part of the outer table removed. The inner table now examined was found somewhat more extensively broken than the outer one, and a piece of the former was discovered, which had imbedded itself in the brain substance after piercing the dura mater, and which was causing suppuration at that point. After removing the fine bone pieces and coagulated blood found there, we took out 3 broken pieces of the inner table which were either of an irregular rhomboid shape or an irregular wedge-form, and 1 to 1.5 cm. in length. At the moment of extraction, pus of reddish brown-colour was discharged in rather copious quantities; and in the occipital lobe, located behind and below the part under consideration, was found a cavity of the size of the thumb-head. Then the part was filled with iodoform gauze, and the margin of the bone-defect being smoothed, the anterior part of the wound was sutured. Subsequently, the defect just mentioned was closed by granulation tissue, and the paroxysmal severe pain existing in the portion from the occipital to the left temporal region greatly abated. The vision on the right side began to show somewhat favourable signs, though the hemianopia on that side remained as ever. The vision registered 20/20 on the left side, and a little less than 20/20 on the right. The examination of the fundus oculi showed a slight congestion of the disc, so that the edges were blurred. No other change was perceptible. When the wound in the head became narrow and small, the patient was able to walk about his room, provided he walked slowly. He was now transferred to the Sasebo Naval Hospital, on December 28th. At that time, there existed a wound surface 8 cm. in length, running from the anterior-superior part obliquely backward and downward, and extending from the upper part of the left lambdoid suture towards the occiput. The anterior half had already healed by first intention and the posterior half showed a depressed granulating surface. A bougie introduced into the wound was led forward and upward to the depth of 2 cm. but did not reach the surface of the bone. The granulation was firm, and the pus discharge slight. At the centre of the wound, bone substance had been lost the size of a thumb-head. There was constant pain, especially intense in the left half of the head, and the patient was unable to get sound sleep at night.

Asthenopia was present, so that he was unable to gaze steadily on any object ; though the reaction of the pupils and the central vision were normal, the disc was found slightly congested. The chief symptom was the restriction of the visual field : by the Förster's perimeter the left eye was ascertained to be 20° in the upper limit, 65° in the lower, 10° in the inner, and 75° in the outer ; and the right eye, 40° in the upper limit, 40° in the lower, 10° in the outer, and 55° in the inner. By January 20th, 1905, the wound was completely healed ; the headache, insomnia and other symptoms greatly abated ; the visual field had expanded a little, and the left eye had 20° in the upper limit, 75° in the lower, 50° in the inner, and 90° in the outer ; and the right eye, 20° in the upper limit, 70° in the lower limit, 75° in the inner, and 50° in the outer. On May 15th, 1905, the patient was transferred to the Yokosuka Naval Hospital. He was there diagnosed as having a tolerably good constitution and favourable nutrition ; and nothing abnormal was found in his looks, attitude of body, movements, or walking. The inspection of the wounded part showed, that in a part three fingers' width above the left auricle, there lay a depressed cicatrix, 10 cm. in length, extending from the middle of the temporal region to the occipital protuberance. In the middle of the cicatrix was a depression 3 cm. long and 1 cm. wide, caused by the defect of bone. He continually complained of an ache on the left half of the head, attended by vertigo, and insomnia. No abnormality was recognized in the reaction of the pupils. The visual field of the left eye was 43° inside, 90° outside, 33° on the upper side, and 72° on the lower side, 12° inside and upside, 52° outside and upside, 54° inside and downside ; and the right eye indicated 65° inside, 46° outside, 40° upside, 77° downside, 49° inside and upside, 67° inside and downside, 13° outside and upside, 53° outside and downside. The vision was 20/20 in both eyes. After this, no change was registered in his symptoms. The patient was relieved of his office and left the hospital on September 20th. His case ran its course in 294 days.

30. Contused Wound on the Forehead, attended by Fracture of the Outer Table of the Frontal Bone ; Contused Wound of the Right Thigh ; Contusion on the Left Internal Malleolus, accompanied by an Injury to the Bone ; Contusion of the Back:— J.P.R., aged 58, an admiral of the Second Russian Pacific Squadron. During the battle off Okinoshima on May 27th, 1905, at about 3 in the afternoon, one of our shells hit the neighbourhood of the fore conning-tower of the *Suroroff*, and a fragment(?) of the shell entered the said tower through a chink between the armour and the roof, and struck the admiral on the parietal region (it may have been the right scapular region ; no statement of any lesion on the parietal region was found in the clinical note after his admission to the hospital).

At the moment, he experienced merely a slight vertigo, from which he was soon recovered. However, when shell-fragments came into the tower again at about 5 p.m., he is said to have received wounds in the forehead, the right thigh, the right internal malleolus, etc. Prior to the sinking of the *Suvoroff*, he removed on board the destroyer *Buiny*, and on the 28th again transferred himself to the *Biedovy* and made a bold dash to escape from the pursuit of the Japanese men-of-war. Failing in this attempt, he was captured by the *Sazanami* at about 5 in the afternoon that day, and was admitted to the Sasebo Naval Hospital on the 30th. On examination there, he was found to have: (a) a contused wound 5 cm. long and 1.5 cm. wide, with an open edge, which ran transversally to the left from the middle part of the forehead along the hair-line, and on a close examination, it was found that this wound had at its right end another, a longitudinal, linear contused wound of 4 cm., so that the shape of the entire wound was like a T standing on its side thus \perp ; and at the bottom of the opened wound, the surface of the bone was exposed, with the periosteum stripped off to the size of a bean. A probe inserted into the wound sank several centimetres downward and outward, and showed that the frontal bone was depressed at that part to the size of the head of a thumb with star-shaped cracks at its margin. (b) On the inner side of the right thigh, at the lower one-third of it, existed a contused wound 12 cm. in antero-posterior diameter, and 7 cm. in supero-inferior diameter. The upper half of the wound was shallow and no deeper than the subcutaneous connective tissues, while the lower half was deeper as it went lower and lower; the surface under question had anæmic muscle fibres protruding; the margin presented a pink colour, and a part of the lower margin was sloughed and had a black colour. (c) There was a contusion 10 cm. in length and 3 cm. in width, which extended from the middle of the left shoulder-joint to the part 4 cm. below and inside of the inferior angle of the left scapula. There was found an extravasation of blood and swelling in the wounded part, and the skin at its right and upper end presented signs of injury to the size of a finger-tip in the tissue beneath; (d) behind and above the internal malleolus on the right side was a superficial contused wound of the size of a thumb-head. Again, below and behind the last-named wound and inside the calcaneum, there was a lacerated wound, pinkish-coloured margin and dirty surface. At the time when he was admitted to the hospital, he had a sound mind and a clear will, without any cerebral symptoms. The temperature registered 37.3°C. When the surface of each wound was cleaned, we extracted from the bottom of the wound at the left end of wound (a) a piece of woollen cloth, the removal of which was followed by the application of aseptic dressing. After this

treatment, all the wounds progressed favourably without showing any marked symptoms of inflammation. Pieces of fractured bone the size of a rice-grain worked themselves loose several times and came out from wounds (*a*) and (*d*); the slough at the lower border of wound (*b*) exfoliated; and on June 13th, out of the swelling at the right end of wound (*a*) there was extracted a broken piece of copper ring 1.2 cm. long, 5 mm. wide, and 3 mm. thick. After this process, the last-mentioned wound gradually contracted, as did also the surfaces of all the other wounds. Wound (*d*) healed perfectly by July 11th; wound (*b*) in the right thigh also formed a cicatrix by August 17th. As regards wound (*a*) on the forehead, the granulations growing on its margin got stuck to the bone beneath before the fractured outer table of the bone had become separated, and the wound was healing in this way with an open space left in the skin. Accordingly, on July 25th, in the afternoon, under the general anaesthetization, an incision was made lengthwise above and below the wound at the middle of its right half, and pieces of the fractured bone, found in the area, 2 cm. long and 1.2 cm. wide, were taken out. Then the wound was sutured, and the inverted edge of the wound on the left half was cut off. Some time after, the surface was almost entirely covered with granulations, though in September there still remained two small patches of exposed bone. The temperature stood at about 37°C. Occasionally, he complained of numbness in both legs, and by the beginning of August, an œdema set in in both legs, especially at the back. The urine was, however, free from albumin, and the nutritive condition had been steadily improving ever since his admission into the hospital. At the time he left hospital on September 10th, he was able to walk about his room without the help of a cane. The days' sickness was 103 days.

31. Penetrating Wound of the Skull (abscess of the brain):—F.S., aged 27, a Russian leading seaman on the *Dmitri Donskoi*, was said to have been injured at about 7 p.m. on May 28th, 1905, while he was working at a gun on the upper deck amidships. On the 31st following, he was admitted into the Sasebo Naval Hospital. On examination, he had a wound-opening of the size of the index finger in the right parietal region, at 6 cm. behind and above the auricle, and at 3 cm. below the right parietal eminence, and on the perpendicular line drawn through the mastoid process of the right temporal bone. On close examination, both the outer and inner tables of the parietal bone were found comminuted, leaving an aperture of the size of a small finger tip. A probe introduced into it was found to sink as much as 5 cm. The patient was in a stupid state; his words almost unintelligible, and at intervals he was in carphologia; incontinence of urine and constipation existed; the muscular strength

of the hand was greatly reduced, and the patellar reflex exaggerated. Ice was applied to the head, and internally a compound of bromide of potassium and iodide of potassium was given. After that he became apathetic and somnolent; the movement of the eyeballs was very slow, being usually fixed and gazing straight ahead; the sight was hardly enough to enable him to recognize the number of fingers held up at the distance of two feet. On or about June 24th, the symptoms mentioned above seemed to have much abated, for the patient was able to tell that he had anaesthesia and paralysis in the left hand, and that he experienced a desire for defecation. On testing the power of sensation, it was found that he could feel one of his hairs when twisted between fingers; and though the patellar reflex increased, the grasping power increased also, in the right hand to eleven kilogrammes, and in the left hand to eight kilogrammes. The temperature stood normal. After progressing in this satisfactory way for some time, on July 3rd, his temperature suddenly registered 38°C ., and the pus discharge from the wound in the head increased abruptly, attended by the aggravation of irritating symptoms. Accordingly, on the 7th of the same month, under the influence of general anaesthetic, trephining was performed near the lower and back side of the wound, and a bone plate of the size of a thumb-head was extracted together with several small bone pieces found lodging in the brain substance. In consequence of this, the symptoms became generally favourable, though there still remained the disturbance of speech, exaggeration of the patellar reflex, a dull sensation in the left upper and lower limbs, and the decrease of grasping power in the left hand. By July 15th, the temperature had fallen; and the patient was able to sit on the bed without help. The operation wound healed first followed by the closing of the original wound, and, the process of cicatrization gradually advancing, he appeared to be on the way of complete recovery, when after the lapse of over a month, on August 23rd, at 2 o'clock a.m., he had a sudden vomiting, in the course of which he ejected a sticky yellow fluid mixed with what he had been eating. Intense headache and giddiness followed. On the 24th, the temperature rose to 37.5°C ., the pupils dilated, the pulse became slow; and he was somnolent, attended by incontinences of urine and faeces, and finally fell into a comatose condition. On the 28th following, under the influence of general anaesthetic, an exploratory incision was performed to the original wound, but no suppurative focus could be recognized to exist. On the 29th, the temperature suddenly rose to 40° , and the patient was utterly unconscious. He died at 5.25 p.m. on that day. Days' treatment in the hospital was 90.

Remarks on the autopsy:—In the dura mater into which the shell-frag-

ment had penetrated, there existed a round aperture large enough to admit an index-finger; the arachnoid membrane and the pia mater around the aperture were found adhering to the surface of cerebrum, and the brain substance to the size of a 2-sen* copper coin which lay about the aperture was recognized as molified. At the posterior end of Sylvian fissure was found lodging a flat bone piece of the size of a finger-nail, but we searched in vain for a shell-fragment. At the upper part of the surface of the right hemisphere of the cerebrum, and close by the intercerebral fissure was found an abscess the size of a goose egg occupying the postcentral gyre and the parietal lobe. The membrane, which had adhered to the surface of the abscess, gave fluctuation on palpation, and an incision into the membrane revealed pus fluid of a sticky greenish nature to the amount of 30 gram. A little way to the back and outside of the wall of the abscess, there existed a small suppurative focus, which was perceived to communicate on one side with the abscess of the brain mentioned before and on the other side with its softened portion connected with the original wound.

32. Penetrating Wound of the Left Parietal Region, attended by Fracture of the Parietal Bone (abscess of the brain); Blind Wound of the Left Leg:—W.S., aged 24, a Russian able seaman on the *Nicolai I*, was injured during the naval battle on May 27th, 1905, and was admitted to the Sasebo Naval Hospital on the 30th. On examination, he was found to have two wounds: (a) at a part about 1.5 cm. to the front of the left parietal eminence, a wound-opening 2 cm. in the longest diameter, with a sharp edge and of a rhomboid shape. Piercing through the bone at the part, it penetrated into the cranial cavity to the depth of about 8 cm. toward the right and back of the opening of the wound, but the existence of any foreign body was uncertain. The upper and lower limbs on the right side had anaesthesia and paralysis. The mind was somewhat obscure, and the speaking was also somewhat impeded; there was, however, no paralysis in the face; sight was normal, and no abnormality could be seen in the pupils. (b) On the inner side of the right leg, and a little above its middle part, there was an oval contused wound 8.5 cm. long and 3 cm. wide. The fibres of the gastro-enemius muscle being exposed, a blind wound penetrating downward from the opening of the wound had been formed, but there existed no foreign body in it. Wound (a) was cleaned and duly dressed. As regards wound (b) it was, after being sutured, dressed aseptically. The latter healed speedily; the former, however, continued to discharge bone pieces at intervals and the evacuation of pus did not cease. Therefore, on July 14th, under the influence of general anaesthetic, a cross incision was given to the mouth of the wound, and the examination then made discovered the existence in the left parietal bone of

* A 2-sen copper coin has a diameter of about 3.1 cm.

a loss of substance, the size of a thumb head, but not attended with cracks around the wound. The part of the membranes and substance of the brain thereby affected had already developed fresh healthy granulations, and on one side of this part there was the orifice of a fistula. The introduction of a probe brought to light the formation of an abscess at the depth of about 4 cm. The pus was now drained off by means of an incision into the abscess, and then by inserting the probe further, a copious amount of pus was discharged, and 3 flat sequestra each 2 cm. in length were extracted. At the bottom of the wound some 8 cm. from the mouth, something foreign, that we suspected to be a shell-fragment, was touched, but we were unable to take it out, and it was left as it was. Only the unhealthy granulations were scraped off, and a suture was given to the incised wound, followed by the introduction of a drainage-tube and the application of an aseptic dressing. Subsequently to this, the discharge of pus was reduced, granulations became favourable, and the mouth of the wound contracted rapidly, so that by the beginning of October there remained merely the orifice of a fistula 2 cm. in depth. As the wound was healing, nutrition was improving, and the paralysis of the right upper and lower limbs was likewise gradually abating. As to the right upper limb, the grasping power was still slightly reduced, but sensation and motion were both restored almost to their normal state. The muscles of the right lower limb were emaciated and very weak, and though the movement of the hip and knee-joints was not impeded, that of the ankle-joint was not free, and the motion of the toes was utterly gone; the knee-jerks were considerably exaggerated on the right side accompanied by ankle-clonus. The patient left the hospital on October 6th, much improved in every way. He had been in hospital for 129 days.

33. Contused and Lacerated Wound of the Face, attended by Comminuted Fracture of the Upper and Lower Maxillary Bones; Blind Wound of the Left Shoulder; Wound with Loss of Soft Tissues in the Left Scapular Region; Explosion-Wounds of the Face:—T. T., aged 26, a 1st class stoker petty officer on the destroyer *Kasumi*.

In the destroyer engagement off Lao-tieh-shan on March 10th, 1904, at a command from the bridge at 4.35 a.m., he took his stand in front of the larboard cylinder with his body towards the stern, and his face towards the



Fig. 7. The fragment of the base fuse extracted from the blind wound of the left scapular region of the patient. The right engraving shows the inner surface, the left the outer. Actual size.

left, and was watching the gauge, with the handle of the adjusting valve in his hand. He was just about to give it a turn, when he was struck by shell-fragments, and fell fainting. At least, this was what we were told. He was examined on board the *Asahi* and was found to have : (a) a contused and lacerated wound, which, starting at the middle of the right ala of the nose and passing through the middle of the right halves of the upper and lower lips, and then running almost horizontally along the buccal region, reached the left angle of the lower maxillary bone. The margins of the wound were heavily torn, and the face was strangely contorted. The left half of the lower maxillary bone had the whole of its alveolar process and a part of the body comminuted, fine pieces of fractured bone being retained in the lacerated gums. At the severed extremity on the right side, the lower maxillary bone had been shot away for a space extending from the lower part of the canine tooth obliquely median. The upper jaw had also the alveolar process collapsed or destroyed from the region of the right canine tooth to the left side, some of the crushed parts hanging by the torn gums. The front region of the upper jaw was also found broken, involving the anterior nasal spine; the cartilage of the nasal septum was separated, the tongue was seen shrinking back on the right side, and was recognized to have a superficial contused wound on its left margin. (b) Outside, and in front of the left shoulder-joint, existed an oval wound aperture 4 cm. long and 2 cm. wide, with its margins contused. The wound had a depth of about 10 cm. and taking an inward course through the deltoid muscle reached Mohrenheim's fossa; and some foreign body was felt at the bottom. (c) In the upper part of the left scapula was found an oval wound with loss of soft tissues, 7 cm. in length and 5 cm. in width. The margin was heavily contused, especially the posterior border, which had its skin peeled and turning out, a wide area around it presenting a blue colour, attended by hæmorrhage in small quantities. Moreover, the face was bespattered with spots of explosion-wounds of the size of a linseed or of a small pea. The same morning on board the *Asahi* a fragment of the fuse of a 47 mm. shell (see Fig. 7) was extracted from the wound (b); and pieces of fractured bone out of the wounds in the face; the wounds in the mucous membranes of the mouth were sutured together, and also the skin and muscles brought into contact and sutured. Then each wound was dressed with an aseptic bandage. Fluid food was given through the end of rubber syringe reaching down to the base of tongue and pressing out its contents so as to force them down the throat. On the 11th of the same month, the patient was admitted to the *Saikio Maru*, from which he was transferred, on the 13th, to the Sasebo Naval Hospital. In the face there was a wound sutured, which beginning at the left angle of the lower

jaw, and running horizontally forward, reached the middle of the lower lip, and, again, beginning at the lateral and lower part of the right ala of the nose and descending almost perpendicularly, reached the upper lip at the outer side of the right angle of the mouth. The upper maxillary bone had lost the greater part of the alveolar processes from the left 1st incisor to the left 1st molar tooth; and the lower maxillary bone had lost the left alveolar processes from the region of the left canine tooth to the left wisdom tooth and the upper half of the body of the mandible. The inner part of the mouth having been severely crushed, the breathing was attended by an offensive smell, but the suture wound had nearly healed, all except a part at the left angle, though the face was swollen in almost every part. The injured right canine tooth, a part of the root of the left 1st molar tooth and the remaining stumps of the broken 2nd molar and wisdom teeth—all in the upper jaw,—were extracted, and all the sharp and rough parts of the upper maxillary bone cut off and trimmed. The immediate result was that the inflammation in the mouth, and the swelling of the face and sublingual gland subsided at once. There was, indeed, a temporary discharge of pus from the antrum of Highmore which, however, ceased in a few days. By the beginning of April, the wound of the face had formed a cicatrix all over; but towards the middle of the same month, inflammation set in somewhere deep down, and the orifice of a fistula was formed in the cicatrized part, from which thick pus escaped though only in slight quantities. This was, however, cured by the end of the same month. The wound with loss of soft tissues in the left scapular region which was the size of a palm, was suppurating slightly, and the larger part of its surface was covered with blackish crusts at the time the patient was admitted to the hospital. The sloughed tissues having been cut off at the hospital, the pus discharge mentioned above was remarkably reduced, and a healthy growth of granulation set in. On the 2nd of April, skin-grafting was performed, and a rapid growth of epidermis commenced along the margins of the grafted skins, which resulted in the total cessation of the pus discharge in May, and the wound had completely healed on the 25th of the same month. The aperture of the blind wound of the left shoulder was about 3 cm. wide and was attended by a profuse discharge of pus. So, a drainage-tube was left inserted in the wound for three days, and irrigated with antiseptic lotion. This assisted the decrease of the pus discharge and the development of healthy granulations, and the wound-opening became gradually smaller, until about April 24th it had healed right over. But after all this favourable course, at the beginning of June, a pain occurred in the left temporal region, the hair began to fall off, the skin fell into an eczematous condition, and the case became chronic. By the

middle of August following, the symptoms were again gone forever. No abnormal symptom appeared again, but the patient had lost, with the upper jaw, 11 teeth, almost the whole of the alveolar processes, and a part of the body of the maxilla; and with the lower jaw, 10 teeth, from the right 2nd incisor to the left wisdom tooth, the entire left half of the alveolar processes, and a part of the left side of the body of the bone. Consequently, the remaining portions of the body and ramus of the mandible were drawn to the left side, and the upper and lower sets of teeth on the right side went apart, and the artificial teeth that were put in were of no avail. Further, the cicatrices formed on the upper and lower lips proved an impediment to pronunciation, and the contortions of the face were very marked. For these reasons, the patient was dismissed from service and left the hospital on September 9th. His case took 184 days in running its course.

34. Contused Wounds of the Left Eye-Lids and Eye-Ball; Contused Wound of the Lips, attended by the Fracture of Incisors of the Upper and Lower Jaws and the Left Canine Teeth of the Upper Jaw; Contused Wound of the Buccal Region; Contused Wound on the Angle of the Left Lower Jaw, attended by Fracture of the Inferior Maxillary Bone; Contused Wound of the Right Thigh; Contusions of the Breast, Forehead, and the Right Thigh:—R.Y., aged 21, a 3rd-class stoker on board the *Mikasa*. During the battle on August 10th, 1904, he was, as a member of the fore fire-brigade, posted in the 3rd compartment of the lower deck, when at 6.30 p.m. a shell pierced into the compartment, and he was injured. On examination, both the conjunctiva and cornea of the left eye were found torn, and, the iris protruding from the rent, the tension of the globe was reduced. Besides this, there existed contused wounds of the lips, accompanied by fracture of the inferior maxillary bone, a blind wound of the right thigh, and almost innumerable large and small contused wounds on the forehead, breast, and right forearm. On the 12th he was sent to the *Saikio Maru*, where evisceratio bulbi having been performed on the left eye, the patient was, on the 14th, transferred to the Sasebo Naval Hospital. At that time, the left eye ball having lost its contents became shrunk and discharged thick pus in slight quantities. There were also a long narrow contused wound extending from the inner end of the left eye-brow to the inner canthus of the eye, and linear contused wounds in the left eye-brow and on the lower eye-lid. The skin of the upper and lower eye-lids was inflamed, rugged, and uneven, presenting a scarlet colour. (b) A part of the upper lip and the whole of the lower lip being destroyed, the larger part of the gums was laid bare. (c) Lateral from the right angle of the mouth was a sutured wound 4 cm. in length. (d) In the part corresponding to the angle of the inferior maxillary bone, behind and below the left angle of the mouth, there was found

R. Y. STOKER. *MIKASA*. WOUNDS ON THE FACE, THE CHEST AND
THE RIGHT THIGH. (34.)



DISCHARGED WITH AN ARTIFICIAL
EYE, AFTER PLASTIC OPERATION.



CICATRICES ON THE FACE. (THE
SAME AS ABOVE.)



the opening of a wound of the size of a thumb-head, which reached to the bone. The inferior maxillary bone had a complete fracture, both on the right and left sides, in front of the both angles of the lower jaw, and the left canine tooth and 4 incisors of the upper jaw, as well as 4 incisors of the lower, were found fractured. (e) In the inner surface of the right thigh, at the lower one-third part, was an oval contused wound of the size of a walnut, the middle part of which formed a blind wound aperture running upwards and backwards to a depth of 3 cm. (f) In the front surface of the forehead, breast, and right thigh, were found numerous large and small contused wounds or contusions. The wounds of the lower jaw discharged a copious amount of pus. They were treated accordingly, first antiseptically, and then by aseptic measures; on the 28th of August, a longitudinal incision was given to the soft tissues at the median line of the lower jaw, followed by a transverse incision running to the right and left along the lower border of the lower maxillary bone, and by another incision made from both angles of the mouth towards the right and left, so that there were formed door-like flaps (thus exposing a large area of bone), and silver wire-sutures were given to the fractured parts of the inferior maxillary bone on both sides. Subsequently, these operation wounds having healed by primary intention, stomatoplasty was performed under the influence of general anaesthetic on September 25th, at the same time pieces of the necrosed part of the bone and a couple of silver threads were extracted. The middle part of the left upper eyelid, which was found adhering to the tissues beneath, was cut in two, and then by means of a transverse incision to the external canthus of the left eye, a plastic operation of the upper and the lower eye-lids was performed, followed by the insertion of an artificial eye. As regards the other wounds, most of them progressed favourably: the blind wound in the right thigh was cured by September 25th, while the wounds in the thoracic region and the forearm had healed even earlier. The one in the left angle of the lower jaw had a fistula left which proved resistant to treatment. It had already been enlarged three times, and the largest part of the left ramus of the inferior maxillary bone, which had fallen into necrosis was now cut away. By way of dealing with that part of the left lower jaw which had drawn towards the left side on account of cicatricial contraction, a skin-deep incision of shape \mathcal{D} was made at the outer side of the left angle of the mouth, and then, a \perp shape suture was given in such a way that the left angle of the mouth was brought as near the median line as possible. As to the skin adhering to the tissues beneath, it was separated from the inside of the mouth; and the deformity resulting from the drawing upwards and inwards of the right angle of the mouth was met by a skin incision 2 cm.

in length, followed by the suturing together of the skin and mucous membrane. By means of this second stomatoplastic operation, the wounds at last healed by first intention. Subsequently the orifice of the fistula closed, after discharging large or small pieces of sequestra and healed on March 23rd, 1905. On May 9th, a stomatoplastic process was performed for a third time, at the left angle of the mouth, which had again constricted, a 2 cm. long skin incision being given, after which the surface of the wound was at last healed. The patient had, however, lost his left eye, his face was deformed by cicatrices on the left eye-lids and around the mouth, and had lost four of the incisors and the left canine tooth in the upper jaw, and four of the incisors in the lower, with a part of the inferior maxillary bone. These losses were made good by the use of artificial teeth, but the cicatrices about the mouth prevented the free opening of the mouth, to the great impediment of speaking, and especially of pronouncing the labials. For these reasons, the patient was dismissed from service and left the hospital on September 18th, 1905. His case ran its course in 384 days. Refer to photographs (34).

35. Contused and Lacerated Wounds of the Face and the Cervical Region attended by Fracture of the Inferior Maxillary Bone, and Injury of the Lower Teeth of the Right Side:—F. S., aged 24, a Russian leading seaman on the *Purik*, sustained injuries on board his ship during the battle of Ulsan on August 14th, 1904, and having received first-aid on the *Idzumo*, was admitted to the Sasebo Naval Hospital on the 15th following. Being examined there, he was found to have following wounds:—(a) A contused and lacerated wound beginning at 4 cm. from the right angle of the mouth and running backward in a horizontal line till it reached the posterior margin of the sterno-cleido-mastoid muscle. It gaped wide open and was very deep, the soft tissues of the face on the right side being cut, the greater part of the body smashed as well as a part of the ramus of the inferior maxillary bone on the same side; resulting in the loss of the larger part of the ramus and 7 teeth from the right 2nd incisor to the right wisdom tooth. Inside the mouth on the right, a considerable portion of the mucous membrane of the cheek being broken, it communicated with the cavity of the mouth. The wound was suppurating intensely, the superficial layer had already begun to slough. (b) A contused wound 3 cm. in length which ran from the anterior end of the last wound obliquely forward and downward. (c) A contused wound 5 cm. long, running to the right and upwards from the right angle of the mouth, which broke through all the tissue layers of the buccal region, and made communication with the mouth. This wound had already been sutured on board the *Idzumo*. (d) A contused and lacerated wound 4

cm. in length, which ran almost horizontally to the left from the middle of the last wound, and reached the oral cavity after breaking all the layers of the lower lip. (e) The right 1st incisor of the upper jaw was found broken. Such being the case, on the 16th following, under the influence of general anaesthetic, the slough and splinters of the fractured bone were removed from wound (a), and the sharp edges of the fractured end scraped, followed by a partial suture of the wound and the introduction of a drainage-tube. Wound (b) and all the other wounds were likewise sutured and given aseptic dressing. Thus, by the 22nd of the same month, wounds (b), (c), and (d) had healed by first intention. As regards wound (a), the margin gaped wide open, and the bottom of the wound communicating with the mouth, the wound presented a really pitiful sight, with suppuration going on briskly, and an escape of green pus, which, however, abated gradually by the end of August. During this time the temperature occasionally rose to 38° C., but more generally, stood at normal. The wound began to show a few somewhat favourable signs. On the 26th, at a deep part of the lower surface of the wound was produced a small suppurating focus, which caused a small fistula to form. On a pressure given to the lower surface of the lower jaw, thick pus came out of the fistula. Accordingly, on the 30th, a counter-opening was made at the right angle of the lower jaw, followed by insertion of a drainage-tube. In this manner, the fistula was healed after a lapse of ten days. After that, granulation developed rapidly, and cicatrization step by step. On September 15th, a small detached fragment of bone was extracted from the ramus of the lower jaw, and on the 22nd following three small fragments of bone were removed again. At the beginning of October, there still remained the small fistula communicating with the mouth and a superficial sore of the size of a thumb-head. The patient was, in this condition, transferred to the Prisoners' Quarters at Matsuyama. He stayed in the hospital for 61 days.

36. Blind Wound of the Neck, attended by Injury of the 3rd Cervical Vertebra:—
T. O., aged 24, a signalman on the *Hatsuse*. During the first attack on Port Arthur on February 9th, 1904, he was engaged in giving range-notice on the port side of the fore bridge, when at 12.20 p.m. he was wounded by a fragment of a shell which hit the boat deck and burst. At the moment he felt that something had hit him at the part that was really injured, but the part gave him but slight pain, and he came down to the lower deck on foot, when he suddenly fell down in a faint. Shortly afterwards he raised himself up and went to the dressing station, as he said. On examination, he was found to have a wound aperture the size of

the head of the index-finger, at 3.3 cm. to the right of the median line of the anterior cervical region at the height of the hyoid bone. Although a probe introduced into the wound did not communicate with the inside of the pharynx, yet air-bubbles came out of the aperture, the saliva was slightly tinged with red, and in trying deglutition the patient complained of intense pain, shooting from the throat toward the upper part of the sternum. No foreign body was felt to exist in the wound, and both pain and bleeding were slight. The wound was dealt with aseptically and gargling with boracic acid lotion was prescribed. On the 11th, he was sent to the Sasebo Naval Hospital on board the *Genkai Maru* and was admitted to the hospital on the 13th following. At that time, a lacerated wound 1 cm. long existed horizontally in the right submaxillary triangle, at a distance of about 3 cm. backward and downward from the angle of the inferior maxillary bone. Sounding showed us that the wound took its course towards the greater cornua of the hyoid bone, but without reaching the bone. The voice was slightly hoarse; swallowing caused a severe pain in the larynx: when we made the patient try to drink milk, the fluid was apt to be sent back and to come bursting out of the nostrils; the breath had a bad smell, and the sputum penetratingly offensive smell. A laryngoscopic examination showed the presence, in the epiglottis, of a granulating sore of the size of a small finger tip. On the 14th (the next day), there suddenly ensued spasms in the cervical region, accompanied by intense pain; the temperature rose to 38.5°C .; a few days later, motor paralysis of the left upper limb came on, followed by numbness of the right lower limb and a paralysis of the left lower limb. When sitting upright for a few minutes, he was distressed by intense pains radiating from the neck towards the breast and back, and this prevented the larynx from being re-examined. On the 27th, paralysis of the bladder and rectum set in; the temperature rose to 40.5°C , and the man began to have a cerebral symptoms. At 3 o'clock p.m. on the 27th, the patient was removed to the surgical ward for the purpose of making an exploratory incision in the left side of the neck. On moving him we found that the movement of the diaphragm was already remarkably weakened, and that the respiratory sound in the left chest was very weak; when his body was slightly raised in order to examine the neck, apnoea suddenly set in, and when, with a view to attaining a partial anaesthesia by the inhalation of chloroform, the patient was given the first drops, his lips suddenly turned purplish blue, and respiration grew very irregular. The examination was accordingly given up, and after a hypodermic administration of camphorated ether, he was removed to his bed. A short while after, he seemed much relieved, but at 4.53 p.m., dyspnoea suddenly came on, and the

patient at last expired at 6 o'clock in the morning. His case ran its course in 18 days.

Summary of the records of the regional autopsy:—At 6.10 p.m. on the 28th of February a regional autopsy was performed. The middle of the right submaxillary triangle had a pea-sized scar, which was covered with a black crust. The scar being removed a probe was introduced, which reached a depth of only about 1 cm. backwards and upwards. An incision of about 8 cm. backward and upward disclosed extravasation of blood behind and below the wound track in the platysma. A further examination made by opening the muscle showed that the track had penetrated towards the lower part of the sublingual gland, and then piercing the part near the lower margin of the front and lower edge of the posterior belly of the digastric, reached the pharynx. Pressure given by a finger against its posterior wall afforded a sensation as if some hard foreign body were imbedded in the body of the vertebra, and also it was recognized that in its course the foreign body had smashed the larger part of the greater cornua of the hyoid bone and run through the part near the right margin of the epiglottis. Then we made a longitudinal opening from the occipital protuberance to the 3rd dorsal vertebra, and advancing the incision into the muscles layer by layer, we found an extensive extravasation of blood about the left side of the 3rd cervical vertebra, the part being at the same time stained with dirty green pus. The soft tissue about the basilar process of the occipital bone and the transverse process of the atlas presented a gray colour in general, the muscles around it having a somewhat pale greenish colour. We then sawed off the right and left laminae and removed the neural arch of the 1st dorsal vertebra, so that the spinal cord was exposed, and discovered that the dura presented signs of inflammation, while a turbid fluid was perceived beneath the membrane. Next, the articulation between the atlas and the occipital condyles was separated, the scalpel sent along the lower border of the 1st dorsal vertebra, and spinal cord between the 1st cervical and the 1st dorsal vertebrae, together with the posterior wall of the pharynx were prepared. An examination now made disclosed the existence of an oval horse-bean-sized wound aperture in the posterior pharyngeal wall opposite the part between the 3rd and 4th cervical vertebrae. The borders of the aperture were found extensively inflamed, and the 3rd cervical vertebra was partially comminuted near the lower end and a little to the left from the median line on the anterior surface of the body of the bone. However, no shell-fragment was to be seen imbedded in the body of the vertebra, and we now perceived that the something which we had felt through the anterior part of the wound track to be a foreign body, was

really the broken part of the body of the vertebra. The supposition as to the whereabouts of the shell-fragment was that after lodging in the injured part of the vertebra for some time, it might have gone out of its place with the discharge and been swallowed into the stomach, as the tissue there had been destroyed. (Remarks by Surgeon Inspector S. Kuwabara, who performed the autopsy.)

37. Perforating Wound of the Left Side of the Neck and the Back:—H. S., aged 24, a 1st-class sub-lieutenant, an acting divisional officer on the *Tokiwa*. At the time of the 2nd blocking attempt of Port Arthur on March 27th, 1904, he was on board the block ship *Yoneyama Maru* and when she forced her way into the entrance of the port, he was standing on the bridge and looking out forward, when he felt something like a shell whizzing near his left ear. At the same time, he felt a sensation as of a heavy weight upon his head, and dropped to the floor on his back, under the impression that everything, from the left eye to the left upper arm, had been shot away. He could not utter a word in spite of all his efforts, and presently became so entirely unconscious, that he was not aware of having been by accident thrown down on the deck and sustained an abrasion on the forehead, while being carried to the quarter-deck on the back of a comrade. When he was about to be transferred into a boat, he recovered consciousness, and attempted, but in vain, to get into it unassisted. His friends had some difficulty in getting him into the boat, where he lay on his back on the stern bench. About 5 o'clock in the morning, he was received on board the torpedo boat *Kāri*, and sent to the *Asama*, where he was for the first time treated by surgeons. When he was wounded, he had on an overcoat, an undress jacket, a waistcoat, a quilted waistcoat, a white worsted flannel shirt for cold weather, a flannel under shirt, and another of striped flannel, and there was to be seen a lacerated aperture like the rays of a star in the hood of his overcoat, in the overcoat itself, in the undress jacket, the waistcoat, etc., all in the back. The wound aperture itself was small and narrow, but the tear in his clothes just over the supra-clavicular fossa and in the neck, was found to be much wider, and had a square shape. When he was examined on the *Asama*, it was found that extending from the upper part of the left supra-clavicular region to the left cervical region there was an aperture of entrance 9 cm. in the longest diameter and over 7 cm. in the shortest, and an aperture of exit, 7 cm. in the longest diameter and 4 cm. in the shortest, was found just above the spine of the left scapula. The skin of the shoulder between these two apertures hung in a bridge-like shape with a hollow cavity beneath; the damage to the muscular substance there was serious, and the area from the scapular region to the 1st intercostal space presented subcutaneous emphysema. No injury was recognised to the bone.



H. S. SUB-LIEUTENANT FIRST CLASS. THE
BLOCK SHIP YONEYAMA MARU.
WOUNDS IN THE NECK. (37.)



CICATRICES ON RECOVERY.



The left upper limb gave intense pain on touch, and the patient complained of paroxysmal pains there which caused a tendency to jactitation; the pulse was faint, the cardiac sound very weak, and dyspnoea had set in. The mind was excited and uneasy. The wound surface was now cleaned, and sterilized gauze inserted, followed by the application of a compress and bandage. Thus the patient was removed to the *Kobe Maru* on the 28th, and transferred to the Sasebo Naval Hospital on the 31st. When examined there, the aperture of entrance was of an irregular oval shape, the margin beginning at 7.7 cm. from the lower end of the auricle, and four fingers' width below the left angle of the lower jaw, and going down along the sterno-cleido-mastoid muscle, till it reached the part where this muscle and the posterior belly of the omohyoid muscle meet after which, running obliquely forward and downward, it reached the place of insertion of the clavicular portion of the trapezius muscle. Then again, taking its course backward and upward, it arrived at the starting point of the aperture. This aperture which was 9.5 cm. in the longest diameter and 7 cm. in the shortest, had a flap of skin the size of the palm of a child's hand and of a valvular shape near the posterior side of its lower end. The aperture of exit was of an oval shape with an oblique position from the supra-spinous fossa of the left scapula to the cervical region, and was 9.5 cm. in the longest diameter and 7.5 cm. in the shortest. Between these two apertures was suspended a rectangular skin-bridge 3 cm. in breadth at its widest middle part, with part of the trapezius attaching to its under side. The wound formed a big hollow cavity, in which were seen exposed all the injured parts of the sterno-cleido-mastoid muscle, the scalenus posticus and medius, musculus levator scapulae, musculus splenius and musculus trapezius. Nearly the whole of the wound surface was covered with tiny pieces of woollen clothes and flannel shirt, with pieces of sloughed tissues adhering, and discharged a copious quantity of thin pus with a slightly offensive smell. No injured part of the apex of the lung or of the brachial plexus was to be seen inside the wound, but there was at times an expectoration dark-red with blood; also, cutaneous emphysema existed from the right and left clavicles below to the 2nd intercostal space, being specially marked in the part from the region of the manubrium sterni to the sternal end of the right 1st intercostal space. Moreover, there was a paroxysmal neuralgia in the left upper limb, and the conjunctivæ and lips evinced anaemia. As a result of the daily removal of foreign bodies and sloughed tissue adhering to the wound surface, followed by antiseptic measures taken from the time when the patient was admitted into the hospital until April 11th, the surface became clean, and the granulations firm, attended by a decrease of pus discharge. From that day, therefore, antiseptic measures were superseded by aseptie ones, and the neuralgia

in the left upper arm, which had been so severe as to call for the help of a narcotic, gradually abated. On April 1st, the patient complained of a pain in the lower part of the left thoracic region, which was combated by application of ice. On the 6th, both hæmoptysis and emphysema were gone, and on the 7th, the pain of the chest disappeared. The cavity of the wound became gradually obliterated, so that by May 8th, the skin that had spanned a bridge formed an adhesion, leaving two surfaces of mere wounds, both of which were half the size of what they were at the time of the patient's admission into the hospital. On the 12th, skin grafting was performed all over the wound surface, with results so favourable that they were both entirely covered with epidermis on the 20th, and the cicatrization progressed day by day. However, the left upper arm became sluggish, with the feeling of a pressing weight at the head of the left shoulder; the elbow and the wrist-joints as well as all the phalangeal joints were kept in a flexed position, and a pain as of tension was felt on the palmar surface of the tip of all the fingers on that side. The skin at the left wrist-joint, the back of the left hand, and the supra-spinous fossa of the left scapula had numbness. By the middle of June, all these symptoms had largely subsided, but the left shoulder was found much lowered as compared with that on the right side; the left upper limb was generally emaciated; the movement of the shoulder-joint and elbow-joint was not free, and the movement of the fingers of the left hand was somewhat impeded. There was, however, a hope of these derangements being cured in due course of time, and the patient left the hospital in a convalescing state to take care of his health at a mineral spring resort. His case ran its course in 91 days. Refer to photograph (37).

SECTION V. INJURIES OF THE TRUNK.

The mortal injuries sustained in the trunk (the chest, abdomen, back, and lumbar region) during the war, were 123 cases of instant death, 26 of subsequent death, and 12 of death at hospitals, which make 161 cases in total. Compared with the total number of mortal injuries of all descriptions, that of wounds of the category under consideration has a percentage of 31.78 for instant death, 22.81 for subsequent death, and 25.53 for death at hospitals; and compared with the total number of cases of mortalities caused by wounds of all kinds, that of the injuries of the category under question has a ratio of 29.33. Thus we see that the injury of the trunk ranks next that of the head (face and neck) in

the number of cases of instant death; and also ranks next to the lower extremities in the number of cases of subsequent death and death at hospital. The total number of mortal or serious injuries in the trunk that resulted in death, invaliding etc., was 223. Of mortal wounds, mutilations of the chest and abdomen, and perforating and penetrating wounds in the same regions were most numerous; and there were 3 cases (for 2 of them see the brief clinical history) of traumatic peritonitis without any remarkable injury to the abdominal walls. The cases in which the wounded persons were invalided or returned to service after recovery, were no more than 25 in all, as far as injuries of the class in consideration are concerned, all the other cases terminating in death. Those who survived injuries were no more than 4 with penetrating wounds of the thoracic cavity (for 3 of them see the brief clinical history), 7 for injuries of the thoracic wall, attended by pleuritis (for 4 of them see the brief clinical history), 7 for other wounds of the thoracic wall (for 2 of them refer to the brief clinical history), 1 for penetrating wound of the abdominal cavity (see the brief clinical history), 1 for wounds with loss of soft tissues in the abdominal wall, 3 for compound fracture in the gluteal region (for 1 of them see the brief clinical history), and 2 others.

The cases of slight injuries in the trunk were only 192, including all those patients who were treated at hospitals or on board the ships. These show a proportion of about one-tenth of similiary slight wounds sustained in various localities of the body (amounting in all to 1,983 cases), and are less by 129, compared with the number of slight wounds received in the face alone, which were 321 in all, and the total number of slight injuries in the abdominal region was but 13. The above fact is a good datum not only for proving the effective, protective power of clothing, but also for demonstrating that wounds received in naval battles, whether serious or otherwise, increase as the seat of wound recedes from the middle part of the body, no matter whether it be above or below.

With a view of affording an opportunity for a comparative study of Japanese with Russian cases, we give in the following clinical histories some instances of injuries received by Russians,—that is, 3 cases of penetrating wounds to the thoracic cavity (of which one was attended by injury of the spinal cord), one

case of perforating wound, and one case each of a penetrating wound to the abdominal cavity and of traumatic peritonitis.

38. Wound with Loss of Soft Tissues of the Right Back accompanied by Fracture of the Scapula ; Contused Wound of the Right Buccal Region attended by Fracture of the Superior Maxillary Bone ; Contused Wound of the Left Zygomatic Region :— Lieutenant Commander, K. U., aged 34, a staff-officer of the First Squadron. During the battle on August 10th, 1904, he was on the compass-bridge of the *Mikasa*, when at 6.30 p.m. a hostile shell hit the semaphore on the fore-bridge and exploded. At this moment, he received injuries and was conveyed pick-a-back by one of the crew to the fore dressing station. On examination, he was found to have the following wounds :—(a) At 2 cm. lateral from the right angle of the mouth was an oval aperture of a penetrating wound 2 cm. wide. After breaking the alveolar processes from the 1st molar tooth to the wisdom tooth and piercing the hard palate, it penetrated into Highmore's antrum. (b) There existed in the left zygomatic region a contused wound 1 cm. in length along the infra-orbicular border. (c) On the dorsal side of the right chest was an irregularly round wound with loss of soft tissues 18 cm. in transverse diameter and 12 cm. in longitudinal diameter, which bordered above with the spine of the scapula, median with the vertebral border of the same bone, and lateral the eighth rib, in the axilla. An irregular round flap of skin hung down from above, the wound surface was rugged and uneven, and the trapezius, latissimus dorsi, teres major and minor, infra-spinatus, and sub-scapularis were found contused and lacerated. The scapula was seriously damaged, but there was no symptom of injury to the organs in the thoracic cavity. With aseptic measures duly given to the wounds, the patient was sent to the *Saikio Maru* on the 12th of the same month, and transferred to the Sasebo Naval Hospital on the 14th. At that time, wound (a) was found inflamed, and the injured side of the face was so swollen that the mouth could only be opened with difficulty. Sloughs of a yellowish white colour were seen sticking to the soft palate ; the alveolar process of the right upper jaw was broken at the root of the 2nd bicuspid, and the wound communicated with Highmore's antrum. Again, the upper maxillary bone had cracks which ran backwards from the root of the molar teeth. Wound (c), covered with a large slough, presented a blue colour ; the larger part of the scapula was comminuted, the entirely detached fragments being mixed with the crushed muscular substance. Both wounds discharged a large quantity of pus, and there was propagation of green-pus bacilli. Accordingly, the slough of muscles and the bone pieces were removed, these processes being followed by application of an antiseptic dressing to each wound. On the day after his ad-

mission to the hospital (August 15th), at about 1 a.m., all of a sudden, intense chill and shivering set in, the temperature rising to 41°C. The patient was in an unconscious state for a while, and had a profuse perspiration. However, at 7 a.m. that day, the temperature fell to 37.5°C.; from that time the temperature presented a remittent type accompanied by an occasional rise to a very high degree; albumin and renal epithelium were found mixed in the urine, and pus escaped profusely out of the opening of the wound in the mouth. The wound in the scapular region was subsequently deprived of the slough by deciduation and the pus discharge was gradually decreasing, but the albumin in the urine was steadily increasing. The urine became so much reduced in quantity, that the quantity evacuated in 24 hours did not amount to 500 grammes. Debility kept increasing, and although no pyogenic bacteria were discovered in the blood nor isolated from it, yet the increase of white corpuscles was remarkable; headache, giddiness, intense thirst, and night-sweat existed, and the temperature was of a remittent nature. On the 26th of the same month, dysphagia came on, which, however, returned to a normal state after a short while; the pulse grew more and more frequent; at night the patient was delirious; the mind became clouded, and sometimes, in a state of madness, he would roll about on the bed. In the last stage, the pus discharge from all the wounds was found to be remarkably reduced. The patient finally fell into a comatose condition, and hypodermic injection of saline solution with frequent use of camphorated ether proving of no effect, he died at 1 a.m. on September 4th. His case ran its course in 25 days.

39. Penetrating Wound of the Right Thoracic Cavity, attended by Fracture of the 9th and the 10th Ribs (empyema):—S. T., aged 26, 1st-class Sub-Lieutenant, an acting divisional officer on the *Iwate*. While bombarding the Russian fleet outside Port Arthur on February 9th, 1904, he was posted on the port No. 7 6-inch turret, when he was injured by fragments of a hostile shell which burst on the surface of the sea. On examination, he was found to have an oval wound surface 3 cm. in length and 1 cm. in width in the 8th intercostal region at the part corresponding to the right mammary line. The wound had an irregular margin and the skin was seen rather introverted. The anterior and median half of the wound was superficial, being only skin-deep, but the posterior and lateral half was found to be deep enough to pierce the thoracic wall and to penetrate further in an outward direction. When the injury occurred he sustained a slight shock, which, however, was cured after a short while; there was no coughing or hæmoptysis. Therefore, the wound was aseptically dressed, the subjective symptoms being thus very slight, though the temperature rose to 38°C. On the 11th, the patient was sent by the *Genkai Maru* to the Sasebo Naval

Hospital, where he was admitted on the 13th following. At that time, at the lower margin of the 7th rib on the right mammary line, there was a wound of the size of a pigeon's egg. It was covered on its inner side with black crusts, while on the outer side it was somewhat deeper, and formed a hollow running outward and down, which already presented signs of a slight inflammation, and discharged pus in very small quantities. The patient had occasional coughs and a pain in the side of the chest. The right chest presented on its anterior side generally a dull sound of tympanitic quality on percussion, while there was no dull sound between the anterior and posterior axillary lines of the right chest; the dorsal side gave a dull sound in regions below the inferior angle of the scapula. All over the side of the right chest, both the vocal fremitus and respiratory sound were very faint. The temperature was remittent, and there were signs suggestive of accumulation of fluid in the pleural cavity. About the 21st, emphysema ensued in the 10th intercostal space on the posterior axillary line, presenting fluctuation to the touch. Accordingly, on the 24th, an incision into the pleural cavity was made, when air escaped out of the cavity, followed by a profuse flow of greenish-yellow pus. At the same time, a shell-fragment 4.3 cm. in length, 1.7 in width, and 9.8 grammes in weight (see Fig. 8) was extracted, it having been discovered partially projecting into the pleural cavity by breaking through its parietal layer near the incised part; then a drainage-tube was inserted into the wound. As result, the temperature fell rapidly, the area of dull sound became smaller and smaller by degrees, and the incision orifice forming cicatrices from the surroundings finally grew a tiny fistula, so that by about the 10th April but a slight quantity of thick pus escaped in drops, when a strain was given by the patient.

The circumference of the chest were 39.5 cm. on the healthy side and 38.5 cm. on the injured side, the difference between both being only one cm., but



Fig. 8. A shell fragment extracted from the wound of thoracic cavity of the sub-lieutenant. Its finely lineated part represents the surface of the shell. Actual size.

the fistula showed no tendency to close, so the erethistic granulations of the walls of the fistula had to be scraped off twice. Nevertheless, the pus discharge still continued to increase, so on June 3rd, under the influence of general anaesthetic, the fistula was cut open by 2.5 cm. forward and downward, and by 3.5 cm. backward and upward, so that the 10th rib was reached. The rib, on examination, was found to have, at that point, an incomplete transverse fracture. A part of the upper margin of the fracture being mortified, the rib was now cut off to a length of 1 cm., and ex-

K. U. LIEUTENANT COMMANDER, STAFF ON THE *MIKASA*. COMPOUND
FRACTURE OF THE RIGHT SCAPULA WITH EXTENSIVE LOSS
OF SOFT TISSUES. (38.)



K. T. ORDINARY SEAMAN. *IWATE*. RADIOGRAPH. PENETRATING
WOUND OF THE CHEST. (40.)



tending the incision further upward along the fistula, the 9th rib (?) was reached, which being found partly injured was cut away as much as 1.5 cm. An examination made to the interior showed that the pleura was considerably thickened; and at the blind extremity of fistula was obtained a small iron-fragment of the size of a pin-head. Accordingly, after scraping off the unfavourable granulations on the walls of the fistula, a suture was given to the wound incised. Some time after this, the upper half of the wound was found suppurating, so it was opened; unfortunately not only did it again form a fistula, but there grew another fistula below the operation wound, which by the middle of July went so far as to communicate with the other fistula. Such being the case, the fistulae were now cut open and made into a single ulcerous surface, and the unhealthy granulations were scraped off. In consequence, the wound became gradually contracted and the pus discharge had almost entirely ceased in August. It finally healed, forming a hollow depression due to cicatricial contraction, with the resected part of the ribs for its deepest centre, and as to the penetrating wound in the anterior part of the right chest, it had completely healed prior to this, about the middle of March. Thus, having each wound wholly cured without leaving any impediment to the thorax, the patient left the hospital on August 30th. His case spent 203 days in running its course.

40. Perforating Wound of the Upper Arm; Penetrating Wound of the Right Thoracic Cavity, accompanied by Fracture of the 6th Rib (empyema):—K. T., aged 21, an ordinary seaman on the *Iwate*. During the first attack upon Port Arthur on February 9th, 1904, he was at work behind the starboard No. 5 12-pounder gun on the aft shelter deck, when he was injured at 12.25 p.m. by a shell which burst on the sea. Examination found in him the following wounds:—There was an aperture of entrance of the size of a 5-*rin* copper piece at the middle of the outer side of the right upper arm, which, obliquely perforating the biceps brachii, terminated at the aperture of exit of the size of a 10-*sen** silver coin located in the inner and anterior side of the upper part of the right upper arm. And in the region of the right 6th rib, on the anterior axillary line, was another wound of entrance, 2 cm. in length and 1.7 cm. in width. After aseptic dressing had been given to the wounds, on the 11th, the patient was sent by the *Genkai Maru* to the Sasebo Naval Hospital, into which he was admitted on the 13th following. At the time when he was examined at the hospital, both of the wounds in the right upper arm and the right axilla had a slight discharge of pus; the temperature continued above 38° C., and dyspnoea attended. A dull sound was recognized in the regions below the 6th rib on the anterior side of the right chest, and also below the lower angle of the

* A 10-*sen* silver coin has a diameter of about 1.7 cm.

scapula on its dorsal side. Repeated examination made by means of the X-rays failed to detect the existence of any foreign body in the thoracic cavity; however, effusion seemed to be still increasing, and the trouble was diagnosed as being a complicating empyema. On February 27th, a skin incision, 10 cm. in length, was made upwards and downwards along the wound, in order to examine the inside, and it was found that the 6th rib, outside and backward of the incision wound, was fractured. Accordingly, the rib was resected at 4.7 cm. forward of the fractured point mentioned above, and a drainage-tube was inserted into the wound. All the symptoms then subsided for a time, but about March 19th, the temperature, which had been going down, began to rise again, attended by a profuse flow of pus, and an X-ray examination showed a large accumulation of pus in the pleural cavity. The wound being again enlarged backwards, the free end of the posterior fragment of the 6th rib was again cut short by 1 cm., and two pieces of the fractured bone retained at that part were extracted. In consequence of this operation, the temperature fell and the pus discharge once more, but on April 3rd, the temperature rose again, chill came on, and the discharge of pus from the thorax increased. On the 8th, a new examination from forward was made with the help of X-rays, which revealed a little-finger-tip-sized iron-fragment 3 cm. inward and above the lower angle of the left scapula. At the same time it was recognized that the wound orifice was gradually becoming contracted. Hereupon, on both the 12th and 13th, four radiographs of the chest were taken by the vacuum tube with the cooling apparatus, the ray being passed over front and back of the chest for 10 minutes respectively, and the primary current being 85 volts and 3 ampères. On the 13th, with a view to removing the foreign body, under the influence of general anaesthetic, an incision, 12.5 cm. in length, was made from a part 2 fingers' breadth median and below the lower angle of the right scapula, lateral along the 8th rib; the latissimus dorsi was dissected, and the 8th rib was reached, of which 5.6 cm. were then cut away. Then the parietal pleura were incised. They were found coated with fibrinous tissue, which being broken away, there was taken out, together with some fine broken pieces of clothes, a shell-fragment of a semi-rectangular shape, 1.9 cm. long, 1.7 cm. wide, 1.6 cm. thick, and 13 gram. in weight, and with woollen cloth fibres sticking to one side of it. After this, there was a copious escape of pus from the operation wound, and the temperature fell considerably. However, all the tissues around the wound were suppurating, with numerous pus focuses between the muscular tissues. From about the time of the last X-ray examination, the portions of the skin to be enumerated below began to change to an erythematous condition and presented a brownish red colour—that is, the portions of the skin about the wound in the back, especially the portion, 19

cm. in length and 9 cm. in width, median and below the wound; on the breast, the neighbourhood of the right mammary gland; from the region of the left 2nd rib down to the part 4 cm. below the left mammary gland, and extending as far as the right anterior axillary line—and these portions had numberless vesicles and pustules over a large area near their centres. Accordingly, on the 26th, the vesicles were punctured, followed by the sprinkling of oxide of zinc with starch; then the parts were covered with dry cotton gauze, over which was spread a sheet of linseed oil paper. Into the wound a drainage-tube was inserted. In consequence, the escape of pus out of the chest gradually subsided, but the breaking of the vesicles and pustules on the erythematous area

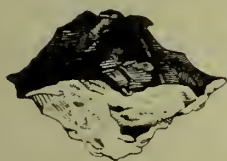


Fig. 9. The shell fragment removed from the wound in the chest of the patient—case 40. The darker portion of the figure represents the part with the piece of clothes. Actual size.

of the skin was followed by superficial ulcers with crethistic granulations. Moreover, fresh eruptions began to appear around the ulcers, which were seen to be gradually propagating; at the same time the pus discharge from the ulcers in front of the chest becoming markedly profuse by the middle of May. The eruptions continuing to increase were found to attack the anterior side of the neck and the shoulder-joint, and even the skin over Mohrenheim's fossa was affected by the erythematous change, followed by the appearance of ulcers and white patches. Those in the back, however, got dry and contracted by degrees, leaving cicatrices

and white spots behind, and became completely dried by the beginning of June. On the other hand, those in the breast presented no sign of cure, with an ever increasing flow of pus and proliferation of bacillus pyocyaneus to such an extent that application of boracic ointment or picric acid solution now proved of no effect. The ones dotted over the anterior part of the neck, however, gradually healed. The incision wound at the lower angle of the scapula for extracting the shell-fragment was healed by the end of June; and the perforating wound of the right upper arm and the penetrating wound of the axilla had already formed cicatrization. The eroded areas in the breast, however, had crethistic and easily bleeding granulations and in scraping off the pseudo-membrane over the granulations the patient complained of severe pain. A mixture of cocaine, glycerine, and bicarbonate of soda was therefore applied to the areas and corrosive sublimate solution was used instead of picric acid, which was found to be too irritative in the present case. From that time the wound became gradually contracted, and the discharge of green pus was much reduced by the beginning of August. The wound measured 19 cm. in longitudinal diameter, 8 cm. in the

upper part, and 13 cm. in the lower part, of its width, and had in its centre a dark red patch surrounded by white spots, which occupied one-third of the whole area of the surface. In the middle of August the granulating area at the middle part of the wound was seen to have sloughs of a purple-blue colour adhering to it, which, however, exfoliated of their own accord in a few days, and the wound became fairly clean. At the end of August, the wound was covered with a thick white false membrane, apparently like pus, attended by a pain at that spot. The middle part of the surface sloughed, and the granulation being destroyed, it altered to a dark purple hue. However, by the end of October there had developed a red, uneven and rugged granulation, so on the 10th of November skin-grafting was performed to its upper part. The grafted skin favourably accomplished union in an insular form, but the other part of the ulcer still discharged a copious amount of pus and a slough was produced again in its lower part, which caused profuse escape of pus accompanying the separation. In January 1905, euguforn was externally applied in powder, the patient at the same time being ordered to bathe his whole body. From that time, the wound appeared to become smaller and smaller. On March 14th, euguforn was replaced by isoform, for which was subsequently substituted a mixture of boracic acid and bismuth oxynitrate. On the 25th of June, the skin grafting was repeated. This presented a favourable inclination at first, but in July a heavy suppuration set in again, and the secretion of an offensive pus went on ceaselessly, the infection of *baeillus pyocyaneus* being clearly recognizable. Towards the end of the same year, cicatrization, commencing at the margin of the wound, advanced towards the centre, and new blood vessels were to be seen in the orlematous granulations. From March 14th, 1906, the patient was ordered to expose the ulcerous surface to the sunlight for 10 minutes each day. About July 2nd, the wound was found to have shrunk to the size of the palm of a child's hand. Prior to this, a small orifice of a fistula had been formed at the middle of the granulating surface, which was constantly evacuating thick pus in slight quantities. An incision was now made and inner surface of the 6th costal cartilage was scraped. This seemed to have promoted the cure, for the granulations following the exanthema now became brisk in the process of cicatrization, and by October the wound had contracted to the size of a finger-head, all the surface, except the margin of the fistula, having formed cicatrization. However, the right chest became markedly shrunk, so that the vital capacity was reduced to 1,800 cubic centimetres, and the patient felt an acceleration of breathing even when at slight work. Besides this, he had an extensive cicatrix on the breast, so he was dismissed from service and left the hospital on December 30th. His

case ran its course in 1,055 days. See radiograph (40).

41. Penetrating Wound of the Thoracic Cavity (Haemo-pneumo-thorax); Contused Wound of the Anterior Cervical Region:—K. S., aged 22, a midshipman on the *Shikishima*. In the battle of the Japan Sea on May 27th, 1905, at 6.35 p.m. a hostile shell hit her foremast and burst. At that moment the midshipman was on the compass bridge and was injured by the shell-fragments. On examination, there was found on the back of the left chest a horse-bean-sized aperture of penetrating wound in the intercostal space at a distance of 6 cm. to the left of the spinous process of the 9th dorsal vertebra. A probe introduced into the wound reached the depth of 15 cm. outward and forward, along the lower margin of the 9th rib. No escape of air was perceived, but on the same night the patient vomited about 30 gram. of blood three times. The face was pale, the pulse fine and frequent, and there was distress in the chest, and slight coughing at intervals. He had, besides, on the front and right side of the neck, 2 bean-sized skin-deep contused wounds. Ice was applied on the breast, and he was admitted to the Sasebo Naval Hospital on the 30th following. At that time, on percussion the left chest gave a tympanitic sound, generally on the anterior side, and a dull sound in the inferior part of the left chest; on auscultation at the part below the lower angle of the scapula, the respiratory murmur was absent. An exploratory puncture obtained some dark red blood. The next day (31st), under the influence of general anaesthetic, the 9th rib was resected by a length of 5 cm. behind the posterior axillary line, and 150 gram. of blood were drawn off, and the pleural cavity irrigated with saline solution. After this, the wound took a favourable course: although pus corpuscles were recognized in the effusion of the cavity, the inflammatory process was very slight; the temperature stood somewhere about 38°C. at first, but soon fell to the normal. On the 10th of July, an X-ray examination being made, an iron-fragment was discovered in the 8th intercostal space 2 cm. behind the anterior axillary line of the left breast. Under local anaesthetic, a shell-fragment 1.1 cm. in length, 0.8 cm. in width, 0.4 cm. in thickness, and 1 gram. in weight, coated with fibrin was extracted from the locality above mentioned. The incision wound healed by primary intention. By the beginning of August, the opening made for the resection of the rib had closed, leaving a small fistula. The vital capacity indicated 3,000 c.c. By the latter part of the same month, the fistula as well as the aperture of entrance had healed by cicatrization. However, nutrition was not yet fully restored, and so the patient received further treatment. At the end of October the vital capacity registered 3,550 c.c., and health was restored to a normal condition. The patient left the

hospital on the 5th of November. His case ran its course in 162 days.

42. Penetrating Wound of the Thoracic Cavity, attended by Injury of the 7th Dorsal Vertebra and the 7th Rib (injury of the spinal cord):—W. S., aged 25, a Russian first class gun-layer on the *Rurik*. In the battle of Ulsan on August 14th, 1904, he was injured while at work as a member of the port fore 8-inch gun crew of the *Rurik*. He was taken on board a vessel belonging to our Second Squadron, on which he received first-aid, and was admitted into the Sasebo Naval Hospital on the afternoon of the next day (the 15th). On examination, he was found to have a wound of the size of a bean in the median line of the back, at the region of the spinous process of the 6th dorsal vertebra. The wound was recognized to run forwards and downwards to a depth of 3 cm. Bleeding had already stopped and there was as yet no sign of suppuration, only marked paraplegia. All the areas below the 8th intercostal space on both dorsal and lateral sides, and, as to the anterior side, all the parts 3 fingers' width below from the ensiform appendix of the sternum, had totally lost the functions of sensibility and motion. The bladder and rectum were also involved in the derangement. Accordingly, on the 16th, at 8 p.m., under chloroform the wound was incised upwards and downwards, and enlarged by about 15 cm., and a part of the spinous process of the 6th thoracic vertebra was removed, followed by the removal of the spinous process and the neural arch of the 7th thoracic vertebra. Here it was found that a part of the spinal meninges was injured, though the surgeons did not recognize the existence of a shell-fragment in the spinal canal. Accordingly, the cut edges of the bone were made blunt, and the incised soft tissues sutured; also, the wound, after being filled with iodoform gauze, was protected with a cover. After this, inflammatory symptoms became aggravated, so that from the 17th there was an escape of thin pus; the appetite was gone, anæmia increased, the temperature indicated 39.5°C ., the beats of the pulse counted 120, and breathing 40. Besides, coughing occurred at intervals, attended with slight expectoration. As to the existence of hæmoptysis before his admission to the hospital, nothing was known, but he had none after admission. All over the chest, rhonchus could be heard and dyspnoea to a moderate degree. Ice was applied to the chest, and stimulants administered internally. On the 18th and 19th following, the temperature still remained at between 39°C . and 40°C . In spite of the gradual increase of debility, no abnormality was found to have occurred to the mind. At that stage, a dull note was audible all over the back and front of the left chest, and on auscultation the moist and crepitant râle were audible; and the breathing became accelerated. Thus in a state of debility and suffocation, the patient died at 5 o'clock in the afternoon, on the 20th. He stayed in the hospital for five days.

Regional autopsy :—A part of the spinous process of both the 6th dorsal vertebra and the whole of the same process of the 7th dorsal vertebra were found lacking. The 7th dorsal vertebra was found deprived of almost whole of the arch, and the spinal meninges had a longitudinal lacerated wound 2 cm. long. The spinal cord at that part was softened, and was found flowing out through the opening in a mud-like condition, together with spinal fluid. The greater part of the left pleura was adherent, and about 1,500 grammes of a turbid fluid mixed with blood were found filling the pleural cavity. Near the posterior border of the upper lobe of the left lung, at about 3 cm. above the root of the lung, there existed a piercing wound large enough to admit a pencil. Near the front side of the left lung, at the part corresponding to the mammary line and the 3rd rib, was found a bean-sized shell-fragment lodging in the lung substance, the apex of the fragment protruding into the pleural cavity. It seems probable that the shell-fragment piercing through the arch on the left side of the 7th dorsal vertebra, had entered the spinal canal breaking the spinal meninges and injuring the spinal cord; then, through the joint between the body of the 7th dorsal vertebra and the 7th rib, it had penetrated into the thoracic cavity, and so reached the anterior side of the lung, where the fragment remained imbedded, as it lacked force enough to perforate further into the anterior thoracic wall.

43. Blind Wound of the Neck; Perforating Wound of the Scapular Region; Blind Wound of the Occipital Region; Penetrating Wound into the Thoracic Cavity, accompanied by Injury of the 10th Rib (empyema); Blind Wound of the Right Thigh; and Contused Wound of the Back:—J. S., aged 27, a Russian gun layer on the *Rurik*, was injured while at work as a gun crew during the battle of Ulsan on August 14th, 1904. After receiving first-aid from a surgeon belonging to our Second Squadron, he was sent to the Sasebo Naval Hospital on the afternoon of the 15th following. On examination, he was found to have the following injuries :—(a) At 4 cm. backwards from the left angle of the lower jaw there was a bean-sized wound of entrance, which, reaching the posterior wall of the pharynx at the depth of 8 cm. forwards and inwards, terminated blind. (b) At the suprascapular fossa of the right scapula, and at a distance of 3 cm. above the middle of the fossa, was a horse-bean-sized wound of entrance, which taking its course forwards terminated in wound of exit located at a distance of 4 cm. from the former wound. (c) Just below the external occipital protuberance existed a horse-bean-sized blind wound, in which an iron-fragment was found lodging. (d) At a part, 4 fingers' width below the inferior angle of the left scapula, was seen a bean-sized wound of entrance, which after injuring the 10th rib communicated with the thoracic cavity. (e) The front and middle part of the

right thigh had a horse-bean-sized wound of entrance, which was 3 cm. deep backwards and inwards. (*f*) In the back, at the region of the 8th dorsal vertebra, there was an irregular-shaped contused wound of 3 cm. in diameter. All the wounds enumerated above were seen to be dirty and presented signs of inflammation. Accordingly, on the next day (the 16th), under the influence of general anæsthetic, the aperture of each wound save the 3rd and 4th, was enlarged, followed by antiseptic dressing. After this, the discharge of pus became copious; pain occurred in the left chest, and coughing and expectoration supervened. The temperature became remittent. Such being the case, on the 28th, an incision was again made, under the influence of general anæsthetic, to a length of 19 cm. in the region of the 10th rib, beginning from the middle point between the left interscapular space, towards the left axillary line. Thus the 10th rib being exposed, 8 cm. of the same bone was excised, and an examination made into the pleural cavity showed that the left pulmonary pleura had within it a pea-sized wound, which appeared to be the aperture of entrance to the wound of the lung, and that its margin had already formed cicatrization. Both ends of the wound by operation were now sutured with a drainage tube inserted at the middle. There still remained a copious outflow of pus for some time longer, but by October 1st, the wound had entirely closed, the symptoms pertaining to the respiratory organs subsiding at the same time, and the temperature returning to normal. All the other injuries had healed previously by cicatrization. After this, the part incised in the back for resecting the rib broke spontaneously and evacuated a small quantity of pus. No symptom relating to the respiratory organs supervened, and after some more incision and scraping, the wound was completely healed by November 20th, without leaving any symptom of affection of the respiratory organ. Thus the patient was transferred to the Prisoners' Quarters at Matsuyama on the 17th of December. He had stayed at the hospital for 124 days.

44. Perforating Wound of the Chest (pneumo-thorax):—J.V., aged 28, a Russian petty officer on the *Dmitri Donskoi*. During the engagement in the neighbourhood of Dagelet-island on May 28th, 1905, he was injured, about 8 p.m. on the upper deck of the ship. He is said to have lost consciousness for a moment, though he soon came to himself again. On the 31st of the same month, he was admitted to the Sasebo Naval Hospital. On examination, in the right side of the breast, inwards from the mammary line, and on the 4th rib, there was found an irregular-shaped wound of entrance 1 cm. in diameter; again, at a distance of 6 cm. downwards from the inferior angle of the right scapula, and at a distance of 3 cm. from the posterior axillary line, there was

found an aperture of exit, 0.5 cm. in diameter. Both apertures, of entrance and of exit, were covered with blood-clots. All the area from the middle of the right interseapular region to the gluteal region was affected with subcutaneous emphysema. On percussion, the right breast gave tympanitic sound everywhere, as did also the dorsal side from the middle of the interseapular region to the 8th rib, and below the lower angle of the scapula it also gave a dull tympanitic sound. The respiratory murmur was weak; coughing existed; sputum with pus and blood and lacking in foam was expectorated; and there was dyspnoea. The temperature registered 38°C. Accordingly, the patient was ordered to take quiet rest and a sedative was given him. Treated in this way, the wound both of entrance and exit soon closed and healed; and the subcutaneous emphysema also disappeared in a little over a week. In about ten days, the sputum improved so as to have no blood in it. The pneumothorax lingered somewhat longer, and expiration was accompanied with a mild wheezing sound; also a slight dyspnoea existed. As the symptoms of pneumothorax abated, rhonchus and crepitation were audible; asthmatic fits came on at night (asthma was said to be chronic with him). The temperature stood at normal for several days after his admission into the hospital, but then again it rose occasionally to somewhere about 38°C. By the end of July, the respiratory murmur became clear, the dull sound almost entirely disappeared, and a whistling sound took its place all over the breast. By the beginning of September all the symptoms had disappeared, excepting the crepitation which remained on the anterior and posterior sides of the right chest. Thus the patient left the hospital on the 10th of September. Days' treatment at the hospital was 102.

45. Penetrating Wound of the Thoracic Cavity (hæmothorax):—P. K., aged 23, a stoker on the Russian destroyer *Gromki*, sustained an injury on the upper deck of the vessel, about 10 a.m. on May 28th, 1905 (battle of the Japan Sea), and lost his consciousness. He recovered his senses when drawn below the water with his ship, and rising to the surface was floating about for some 20 minutes, before being rescued. On the 31st following, he was placed in the Sasebo Naval Hospital. There he was examined and was found to have a bean-sized round aperture of entrance near the sternum at the upper margin of the 2nd costal cartilage in the left breast. The aperture which was already closed had a slight quantity of pus sticking to it. Examination showed that the breast gave a tympanitic sound in the part extending from the left supraclavicular region to the 2nd intercostal space; a dull sound of tympanitic quality between the 3rd and 4th intercostal spaces, and a dull sound everywhere below the 5th rib. On the back, the chest presented a tympanitic

dull sound everywhere above and below the spine of the scapula, while every part below its inferior angle had a dull sound. On auscultation below the 3rd intercostal space on the breast, the respiratory murmur was absent while above the same region the bronchial breathing could be heard. By exploratory puncture into the pleural cavity some blood was obtained. There were constant coughing and expectoration, accompanied by spitting of blood, and dyspnoea. Application of ice to the left chest and the internal use of a mixture of opium and plumbi acetat were now prescribed. On the 7th of June, the 7th intercostal region on the left posterior axillary line was punctured and about 100 grammes of blood drawn out. In September the hæmoptysis ceased, but the pulse was still as fine as ever, and the patient complained of distress in the chest; anæmic symptoms became markedly intense. The temperature beginning to rise on June 1st reached 39°C. on the 6th; then after lingering awhile between 37.5°, and 38.5° it fell to normal on August 7th. For the exudation in the left thoracic cavity, paracentesis was performed on August 4th, and 860 grammes of a brownish-red fluid were drawn away, in consequence of which the area of the dull sound became very small; the appetite was restored, anæmia subsided, and nutrition returned to its normal state. The patient left the hospital completely recovered on September 10th. He stayed at the hospital for 102 days.

46. Contused Wounds of the Occipital and the Left Parietal Region; Contusion of the Left Chest (pleurisy); Abrasions of the Right Middle, Ring, and Little Fingers:—Y. S., Aged 21, an able seaman on the *Hatsuse*. At the time when the *Hatsuse* met with her disaster on May 15th, 1904, he was employed in lowering a boat on the port side, amidships on the upper deck, when at 12.34 p.m., a spar, blown off by the second explosion, hit him on the head and back, and threw him overboard. He was rescued by the *Kasagi*, on which he was examined and was found to have, in the occipital region, a contused wound 6 cm. in length, which ran to the left and upwards along the lambdoid suture, and stretched over the right and left parietal region and crossed the sagittal suture. It broke the scalp without inflicting any injury on the bone. Parallel with the above, there were two contused wounds—one on the right and below, which was 3 cm. in length, and the other on the left and above, which was 3.5 cm. in length. In the back was a linear contusion 26 cm. in length, which extended from the left interseapular region to the left costal arch. Its margin was extensively swollen, with emphysema under the skin, which gave intense pain on touch, but no fracture of the bone was recognized. Besides these, abrasions were found on the back of the 1st phalanges of the right middle, ring and little fingers. The contused wounds were sutured, and adhesive plaster was applied to

the back. On the same day, about 4 o'clock in the afternoon, the swelling of the back became remarkably aggravated; the pain became intense, dyspnoea occurred, the pulse numbered 130 beats, and a clear friction sound was audible. In the night, the patient was delirious and could not have sound sleep. The temperature indicated 38.2°C. From the 16th, coughing became incessant, sputum with blood was expectorated (the patient afterwards told us that he had brought up sputum like that just after his being taken on the *Kasagi*), and râle was heard in the region of the inferior angle of the left scapula. He was admitted into the *Saikio Maru* on the 17th. At that time, his face was pale, the expression of distress being markedly visible; strong pains existed in the left dorsal and hypochondriac regions, which enhanced on coughing. The left chest was found on inspection to be rather expanded; the respiratory movement was diminished and the vocal fremitus reduced. Over the whole part below the 5th rib on the breast and below the inferior angle of the scapula on the back a dull percussion note was obtained, while over the region above it was of a tympanitic quality. The percussion note over the heart was also of tympanitic quality. Accordingly, each wound was dealt with aseptically; a wet menthol dressing was applied to the left thoracic region; internally a sedative was given, and the patient was ordered to take rest. While on the hospital ship, his course was favourable, and on the 23rd the temperature grew normal; the pulse and breath were restored to their ordinary condition. On the 27th the tympanitic quality of the percussion note as well as the subcutaneous emphysema of the back had entirely disappeared. On the 28th, the patient was removed to the Kure Naval Hospital. When examined at the hospital, the contused wounds of the head were found to be suppurating, but the abrasions of the right fingers were already cured. On the anterior side of the left chest, everywhere below the 5th rib, and on its posterior side, everywhere below the inferior angle of the scapula, a dull percussion note with pleural friction sound was audible. Owing to due treatment given then, the dull note in the chest had disappeared by June 22nd, and the contused wounds in the head had also accomplished cicatrization. Thus all the wounds having healed by the 22nd of June, the patient left the hospital perfectly recovered on July 2nd. His case took 48 days in running its course.

47. Contused Wound of the Right Chest (pleuritis of the right chest); Blind Wound of the Left Elbow, and Contused Wound of the Right Thigh:—C. T., aged 21, an ordinary seaman on the *Itsukushima*, was injured during the gun fight off Lung-wang-tang on August 9th, 1904, and was the same day admitted into the *Kobe Maru*. On examination, he had the following wounds:—(a) A contused wound the size of a 2-sen* copper-piece against the 7th rib on the anterior

* A 2-sen copper-piece has a diameter of about 3.1 cm.

axillary line of the right chest. It gave him severe pain, and its margin was swollen up to the size of the palm of a hand. (b) 2 bean-sized apertures of blind wounds on the external side of the left elbow. These reached the periosteum. (c) A superficial contused wound, 4 cm. in length and 2 cm. in width, in the lower part of the external side of the right thigh. The margins and surfaces of the wounds were now cleansed, followed by aseptic dressings. On the 10th, the temperature rose to 38°C, and the pain in the right chest increased. On the 13th, the chest was examined, when it was found that there existed effusion in the right pleural cavity, and that, on the anterior axillary line, every part below the 6th intercostal space, and on the dorsal side of the chest, every part 2 fingers' width below the inferior angle of the scapula, gave a dull note on percussion. The breath-sounds diminished; vocal fremitus was reduced, and though there was no coughing or expectoration, respiration was somewhat frequent. It was judged that this was because of a complication of traumatic pleuritis of the right chest. As the result of proper measures taken, the temperature became normal by the 17th; the pain in the chest also had disappeared and the exudation been absorbed. The contused wound of the chest healed by the 15th and that in the right thigh by the 16th. Wound (b), that is, those of the left elbow developed favourable granulations after an incision of the skin between the two wounds, and were gradually contracting. The patient was transferred, on September 20th, to the Sasebo Naval Hospital, whence on October 1st, he was again removed to the Kure Naval Hospital. At that time, right inside the external condyle of the right upper arm, there was discovered an ulcer of the size of a bean, and no sign was recognized of the existence of exudation in the right pleural cavity, only respiratory sounds being a little diminished. By due treatment the wounds were well healed on the 7th. From about the 10th, the patient complained of pain in the right side of the chest, which, however, was gone in a few days. Without any further trouble, he was completely recovered and left the hospital on the 3rd of November. The days' treatment was 86.

48. Blind Wound of the Back (pleurisy of the left chest); Contused Wound of the Right Thigh; Blind Wound of the Left Heel:—E. Y., aged 29, a first class petty officer on the *Mikasa*. During the battle on August 10th, 1904, he was, as a messenger, on the fore bridge, when he was injured as a consequence of a hostile shell, which exploded against the semaphore at 6.30 p.m. On examination, he was found to have the following wounds:—(a) At a part 5 cm. to the left of the spinous process of the 6th thoracic vertebra, there was a bean-sized wound of entrance, which entering 5 cm. upwards and inwards terminated

blind. No foreign body was discovered at its bottom, nor was there any spitting of blood. (b) At the middle of the posterior side of the right thigh was a contused wound of a size similar to that of the wound (a), which was of a subcutaneous depth. (c) In the left heel was a bean-sized blind wound, which was as deep as the tendo Achillis. The patient was admitted into the *Saikio Maru* on the 12th, where, from the wound (a) was extracted a small shell-fragment, 0.9 cm. in length, 0.4 cm. both in width and thickness, and 0.4 gram. in weight. On the 14th, he was transferred to the Sasebo Naval Hospital. At that time, all the parts below the inferior angle of the scapula on the dorsal side of the left chest and below the 5th intercostal space on the anterior side, gave dull note on percussion; the vocal fremitus and resonance was reduced; the respiratory sound disappeared. Above the area a friction sound was audible; and on drawing a deep breath, pain was felt in the chest. An exploratory puncture into the pleural cavity disclosed that the effusion contained some amount of blood. The temperature rose to 38°C. after the patient was received on the *Saikio Maru*. This showed that traumatic pleurisy existed as a complication. By due treatment temperature fell to the normal; the effusion was known to be gradually absorbing, and each wound had developed an auspicious granulation. On November 2nd, he was removed to the Maidzuru Naval Hospital. Examination made at that time showed that the lower part of the back of the right chest had a stronger resistance on percussion; the respiratory sound was reduced; there was a friction sound, but no coughing, expectoration, thoracodynia, etc. And all the wounds were found already healed. In the course of due treatment given, the friction sound disappeared too. The patient left the hospital completely recovered, on December 2nd. His case took 114 days for recovery.

49. Blind Wound caused by a Shrapnel Bullet on the Right Scapular Region attended by Dry Pleurisy of the Right Chest:—U. M., aged 27, a leading seaman belonging to the Naval Heavy Gun Brigade. At the time of the general attack upon the rear of Port Arthur which took place on November 26th, 1904, he was with the Naval Brigade on a hill situated to the west of Ta-si-ko and Shui-shih-ying, when at 1.55 p.m. he was injured by a shrapnel-ball. On examination, it was found that at a distance of 11 cm. inwards from the apex of the acromion process, and at a distance of 6 cm. to the upwards of the spine of the scapula, and corresponding in height to the 7th cervical vertebra, there existed an aperture of entrance of the size of an index finger-tip. And against the 9th rib, corresponding to the scapular line on the right side of the back, there was discovered a subcutaneous swelling of the size of pigeon's egg. Therefore, the ball seemed

to have entered from the upper part of the right side of the back, and advancing downwards to have gone through the anterior surface of the scapula, causing, however, no injury to the bone. By opening the wound, the ball was extracted, and the patient was sent to the *Saikio Maru* on the 28th. At that time, pain was felt along the course of the wound-canal, and coughing occurred at intervals, but there was no hæmoptysis. On the 1st of December, he was removed to the Sasebo Naval Hospital. At that time, the patient complained of a dull pain in the part extending from the right interscapular region to the anterior axillary line; the respiratory sound was a little reduced, and there existed a friction sound. Both the wounds were found greatly contracted, thanks to the treatment given before. On the 21st the patient was again transferred to the Kure Naval Hospital. The breath-sounds over the right chest, were reduced, but there was no friction sound, and vocal fremitus was normal too. Both wounds healed by the 27th, but at the same time, there ensued slight amount of coughing and a little expectoration. The temperature rose to 38°C. On the 31st, the symptoms in the chest disappeared, though headache, insomnia, and gastralgia after a meal still remained. However, as the result of the required treatment given, all these symptoms also disappeared in time, and the patient left the hospital on January 19th, 1905. His case took 54 days in running its course.

50. Rupture of the Tympanic Membranes on Both Sides; Contusion of the Chest (hæmoptysis):—W. T., aged 31, a chief petty officer, belonging to the Naval Heavy Gun Brigade. While shelling the Russian ships in the harbour of Port Arthur from a battery on Huo-shih-ling on October 25th, 1904, he received injuries. On examination, no visible wound was found in the outer side of the thoracic wall, but dyspnoea and incessant coughing existed, accompanied by expectoration of blood, pain in the chest, and heavy palpitation. Ice-bags were applied to the chest, the patient was ordered to take rest, and was sent to the *Saikio Maru* on the 29th following. At that time, the respiratory sound in the right chest was found reduced a little, and there were occasional coughs and expectoration of blood sputum in slight quantities, and deafness and tinnitus in both ears. Examination being made into the ears showed that, at the antero-inferior portion of the right tympanic membrane, and, at the antero-superior portion of the same, there existed in each a linseed-sized rupture, blood clots being perceptible around them. As to the left tympanic membrane, its middle part dwindled to the size of a pea, and the tip of the handle of the malleus was seen protruding into the ruptured part. At the time of the patient's admission into the hospital, there was a slight purulent secretion; bone conduction

was normal with both ears; hearing power indicated by the watch test 15/200 for the right ear, and 6/200 for the left. As the result of treatment given, by about November 5th, the symptoms on the respiratory organs had disappeared and the perforated aperture in the right tympanic membrane became markedly smaller. On December 1st, the patient was transferred to the Sasebo Naval Hospital and was again removed to the Kure Naval Hospital on the 9th following. While in the latter hospital, the ruptures of both tympanic membranes closed, but a remarkable thickening was bequeathed to the left side, so much so that whispering could be heard only at a distance less than 70 cm. Consequently, the patient was dismissed from service and left the hospital on March 31st, 1905. His case took 157 days for recovery.

51. Penetrating Wound of the Abdominal Cavity:—K. U., aged 18, a first class boy on the *Otowa*. During the bombardment upon the Russian ship



Fig. 10. Coins and fragments extracted from the wound of abdomen of the patient—case 51. Actual size.

Scitlana off Chuk-pen Bay, Korea, on May 28th, 1905, he was at work at the ammunition-hoist, when, at 10.33 a.m., he was hit by a shell and injured. On examination, the hypogastric region had an irregular oblong contused wound, 10 cm. in longitudinal diameter and 7 cm. in transverse diameter, the mouth of the wound gaped wide, the rectus abdominis muscle and peritoneum had been torn away, the great omentum, ileum, cæcum, and a part of the descending colon prolapsing out of the wound. A considerable part of the intestines was found not only to be considerably injured, but to have torn pieces of clothes and coins (see Fig. 10) penetrating into the

intestinal canal at several points. The intestinal wall being broken in consequence, its contents were seen escaping at some places. The injury to the ileum was most remarkable. Although the hæmorrhage was profuse and the pain severe, there was no mental disturbance. Accordingly, under the chloroform, the foreign bodies in the abdomen were extracted. Then, after suturing the perforated apertures of the intestines, aperture of the wound of the abdominal wall was enlarged upwards as far as the umbilical region, and the intestines replaced carefully;

unfortunately, owing to an extensive defect of the abdominal wall, it was found impossible to have the whole of the reduced intestines protected. All that could be done was to bring together and give suture to a part of the margin of the wound, leaving the rest open, followed by aseptic dressing. On the morning of the 31st of May, the patient was sent to the Sick Quarters at the Takeshiki Secondary Naval Station. At that time, the pulse was rapid and fine, and counted 130 beats; dyspnoea and distress supervened. In spite of everything, the patient finally fell into collapse and died at 10.40 a.m. of that day. His course spent 2 days.

52. Penetrating Wound of the Abdominal Cavity:—K. T., aged 23, a leading seaman on the *Naniwa*. During the engagement in the neighbourhood of Okinoshima on May 27th, 1905, he was at his assigned post at the compass on the starboard side, when at 5.07 p.m. a hostile shell struck the stepping board on the stowage-beam for No. 1 cutter, and at that moment he was hit and injured by some of the splinters of the smashed board. Receiving a blow on the abdomen, he lost consciousness for a while, and so he was taken immediately to the dressing station and examined. At that time, his countenance was still pale, but consciousness had already returned and was clear. The pulse and respiration were normal. On examination, the abdomen was found to have a contused wound 3 cm. in length at the middle of the left iliac region. The depth of the wound reached the muscle only and no foreign body was detected in it. So, the wound was wiped clean, followed by the application of an aseptic dressing to it and of an ice-bag to the abdominal wall. Then the patient was ordered to take rest on his back. As the hours elapsed after reception of injury, the abdominal wall became distended and somewhat abnormally sensitive. On the 28th, the patient complained of pain in the abdomen, which was counteracted by a dose of morphine. On the 29th, the hyperæsthesia and distension of the abdomen still remained as ever. The temperature rose to 38.6°C.; the respiration counted 46; the pulse 110. The appetite was lost, and there was no nausea nor passage of the bowels. On the 29th, he was sent to the *Kobe Maru*. On being examined on the ship, he was found to have a large physique, but to be somewhat out of condition, and the countenance betrayed distress. At the time of his admission on board the hospital ship, the temperature registered 37.4° C.; the pulse was fine, and beats 104; the respiration counted 26 times. Examination as to wound showed that at a part 5 cm. upwards and inwards from the anterior superior spine of the left ilium, in the region of the left iliac fossa there existed a transverse contused wound, already sutured, which was 3 cm. in length. The abdomen

generally presented a distension of medium degree, giving a tympanitic percussion note; there was pain and tenderness, and a little distress in the chest. Accordingly, after removing the ligatures, the part was examined; the margin was seen to be irregularly lacerated, and behind it existed a bean-sized aperture of wound which was found to lead deeper from a corner where the layers of the underlying muscle had been broken. This, on probing, was found to terminate in a blind bottom about half cm. deep. Neither around the wound nor at the bottom was felt any hard foreign body. A slight quantity of wound secretion tinged with blood escaped out of the wound which, however, had no bad smell. Gauze was therefore inserted into it, and absolute rest ordered. On the 31st, the bandage was found considerably moistened with wound secretion, and the patient said he felt worse rather than better. On that day, for the first time, pus with an offensive smell was discharged from the wound, the temperature rose high, the pulse was excited and very quick, and the respiration increased in frequency. On June 2nd, the patient was removed to the Kure Naval Hospital. At that time, the margin of the wound and the abdomen in general were found reddened with infiltration and induration. On percussion, a clear tympanitic note was heard in the part extending from the left iliac region to the umbilical region; the discharge of pus was not only copious, but sometimes fluid intestinal contents having the fecal smell escaped out of the wound after a meal. On June 5th, the pus discharge grew very brisk and was of a black colour. The left spermatic cord was swollen to the size of a thumb-head, and the left epididymis was also swollen and painful. After that the pus began to accumulate in the left iliac fossa. The area which gave the tympanitic percussion note, became well defined. By the 10th of June, a cord-like induration could be felt extending from the 10th rib to the median line of the abdominal wall. A palm-sized part on the left iliac fossa gave out profuse pus on pressure, and also out of the orifice of the fistula was evacuated fecal fluid in increased quantities, with occasional flatulence or even ascaris lumbricoides. On the 17th, the left testicle was also found swollen, which, together with the left epididymis and spermatic cord, gave terrible pain, and undulations could be felt. On the 20th, the left inguinal region broke of itself and evacuated pus. An incision being made above and below, an abundant quantity of pus was obtained, and naturally the distension of the part was reduced. On the 24th, the pus flow suddenly ceased and the operation wounds were covered with healthy granulations. However, the fistula of the left iliac fossa continued incessantly to evacuate pus and fecal fluid. On the 26th, this evacuation stopped all of a sudden, but on the 28th, 150 grammes of pure pus were discharged; then again the pus accumulated and, on July 3rd,

100 grammes were obtained: also as the accumulations went on, quick pulsation, distress, gastralgia and other symptoms supervened. Finally prostration came on and stimulants had to be used. The temperature now indicated 39°C. Accordingly, on the 4th, an incision to the length of 5 cm. was made, above and below, along the left external margin of the rectus abdominis muscle and the suppurative focus was reached, which now evacuated a large quantity of thin pus. The part around the focus was seen adhered to the tissues beneath; the serosa of the intestine was covered evenly and smoothly with a coagulated fibrin layer. The seat of the intestinal perforation could not be ascertained, nor was the interior extremity of the orifice of the fistula attained, owing to the adhesions mentioned before. So, an incision, 3 cm. long, was made in the abdominal wall, on the inner side of the fistula, for the purpose of opening communication between both operation wounds, and then each of the openings was left with a drainage-tube inserted to promote the discharge of pus. On the 5th, a dull percussion note was noticed at the lower border on the dorsal side of the right and left chest, and the respiratory sounds disappeared for a while: but these symptoms were gone in a few days. The incision wounds became favourable in pus discharge, and by the 17th, the one on the external side of the rectus abdominis muscle was closed with granulation. Pus accumulated again, so a 3rd incision was created on the left side of the 2nd one. Then the suppurating focus was cleansed everyday with saline solution, which resulted in the decline of pus discharge, and the evacuated substances became entirely free of fecal smell. On August 6th, the ulcer in the inguinal region healed completely. As to the first operation wound on the external margin of the rectus abdominis, its granulating area grew remarkably smaller, and the second incision wound also closed and became an ulcer. Accordingly, on the 13th, the original fistula and the third incision wound were cut open together, and the granulations within were scraped off. At the same time, the cord-like induration existing between the anterior-superior spinous process of the left ilium and the false rib was incised. By these repeated operations, the suppurating focus grew smaller and smaller by degrees; the pus also decreased, and the nutrition of the whole body was improving; on October 5th, the inserted gauze was only slightly soiled with pus. By the 13th, the 3rd operation wound purposely made for treatment and the original wound had healed by scabbing completely. However, in January of 1906, that part was generally in a state of induration with hyperaesthesia and pain increasing whenever there was stress or pressure on the part. Exercise, also, if extended over several hours, would produce a pain, in the hypogastric region, which was an impediment to free movement. This showed that the intestinal tube had formed an adhesion

at the injured part. However, as the patient had his nutrition restored, he was dismissed from service and left the hospital on March 8th. His case required 285 days in running its course.

53. Contusion of the Left Thoracic and Abdominal Regions, accompanied by Simple Fractures of the 9th and 10th Ribs (a case of traumatic peritonitis):—S.H., aged 23, a 1st writer on the *Iwate*. During the naval engagement fought in the vicinity of Okinoshima on May 27th, 1905, he was engaged in the duty of hoisting 12 pounder ammunition in the aft of the main deck, and was posted in the 6th compartment of the said deck, when at 2.30 p.m. a hostile shell hit the captain's cabin and burst. At this moment he was injured. On examination, he was found to have firstly a contusion of about the size of a hand-palm, extending from the 8th rib of the left chest downwards over the false rib. The part was swollen and of a dark purple hue in general, and had two or three abrasions. Somewhat behind the left posterior axillary line, the 9th and 10th ribs were recognised to have sustained simple fracture. The face was pale, the pulse fine and powerless; nausea and vomiting attended. The breath was short, and the patient complained of an intense pain in the abdomen, passing bloody urine. Accordingly, an adhesive plaster and ice were applied, followed by the internal use of stimulants. Subsequently, the nausea ceased, and the blood in the urine became much smaller in quantity. The temperature, however, having risen to 38°C., a small quantity of liquid diet was given, and then by the internal use of morphine the patient was put to quiet rest. On the 30th, the symptoms became more pronounced; the temperature registered 39°C.; the pulse beat 110, and the breathing counted 36. Abdominal distension and hyperæsthesia appeared with burning thirst and frequent nausea. On June 1st, the patient was sent to the *Kobe Maru*. At that time, his face was pale, the orbital cavity depressed, the respiration shallow, the skin covered with cold perspiration; he complained of distress in the chest and abdomen, and the temperature rose high. An examination of the injured part showed that the skin was swollen almost everywhere below the left 8th rib, accompanied by extravasations and abrasions here and there. At the 9th and 10th ribs on the posterior axillary line, there was recognized a crepitus; the abdominal region—especially the superior part of it—was much distended, attended with severe pain, so that the boundary of the dullness of the liver was gone. Moreover, he vomited blood and some grass green liquid matter. Every method of treatment to arrest the vomiting was fruitless, and the symptoms of prostration and collapse aggravating, he at last expired at 7 o'clock on the morning of June 2nd. His case ended in 6 days.

54. Traumatic Peritonitis:—T. Y., aged 16, a hired servant, belonging to

the Submarine Mining Corps of the Combined Fleet. At the time when a mechanical mine exploded on the *Taihoku Maru* on June 13th, 1904, he was in the pantry of the lower deck of the ship, arranging utensils, and was injured in consequence of the explosion. He was immediately sent to the *Saikio Maru*. On examination, he was found to have a moderate constitution and good nutrition. As to his injuries, with the exception of a pea-sized explosion-wound at the middle of the bridge of the nose, no other lesion was perceptible in any part of the body. He had a severe gastralgia and symptoms of prostration; the face was haggard, the respiration accelerated. Physical symptoms showed the chest to have no abnormality. The abdomen was a little distended and, on percussion, gave a tympanitic sound in general, attended with tenderness; nausea, vomiting, and intense thirst existed. The matter vomited was at first what he had eaten, but finally changed to a watery fluid, which contained a slight quantity of coagulated blood. The pulse was frequent and tense. The case was diagnosed to be traumatic peritonitis. An ice-bag was applied to the abdomen, a mixture of opium and cerium oxalate was given internally and he was allowed to swallow small lumps of ice. These measures however had no effect, and in the night the pulse became gradually fine and weak, the lips turned pale, the body was covered with cold sweat, and vomiting became very frequent. On the morning of the next day (the 14th), the vomiting grew even more frequent, the vomited matter being green and watery, and containing coffee-like deposits. The limbs were growing colder and colder. The internal use of brandy and injection of saline solution now proved of no use. Thus the patient finally died at 12.20 in the afternoon that day. His course ran one day.

55. Contusion of the Chest and Abdomen (traumatic peritonitis); Contused Wounds of the Left Index and Middle Fingers; Wound with Loss of Soft Tissues of the Right Calf:—S.S., aged 25, a Russian leading seaman on the *Dmitori Donskoi*, was injured during the battle fought near Okinoshima on May 27th, 1905. He was admitted to the Sasebo Naval Hospital on the afternoon of the 31st, and when examined was found to have the following wounds:—(a) There was an extensive extravasation of blood extending from the chest to the abdomen; the abdominal wall was distended, a slight touch to it producing an intense pain. Vomiting occurred frequently, the contents of the stomach and intestines, of a yellowish green colour, and having the smell of feces being brought up. (b) On the dorsal side of the left index and in the middle finger at the metacarpo-phalangeal articulation, respectively, there was a contused wound of the size of a little-finger tip. (c) Extending over from the middle one-third of the calf of the right leg to the lower one-third of the same, was found a wound with loss of soft tissues

10 cm. in length and 6 cm. in width. An ice-bag was accordingly applied to the abdominal region and opium administered internally; wounds (b) and (c) were aseptically dressed. All these measures failing to take effect, the symptoms of peritonitis became more pronounced, and the patient finally fell into a state of prostration and died at 9.30 a.m. on the 3rd of June. He was at the hospital for 3 days.

56. Penetrating Wound of the Abdominal Cavity (faecal fistula):—I. P., aged 27, a Russian leading seaman on the *Orel*. During the naval battle fought in the neighbourhood of Okinoshima on May 27th, 1905, he was, at about 3 o'clock p.m., injured by the side of No. 30 port-side gun. He was taken directly to the sick-bay and had a dressing applied. He is said to have vomited once in the ship. On May 30th, he was admitted into the Maidzuru naval Hospital. On examination, he was found to have both good nutrition and constitution; the mind and body were comparatively quiet, no distress was noticeable, and vomiting had already ceased. Examination made of the injured part showed that, at a distance of 5 cm. upwards and inwards from the anterior-superior spine of the left ilium, there was a wound with the diameter of about 3 cm. The great omentum was found swollen and protruding so as to present a soft flexible and elastic mass, coarse on the surface. The abdominal wall was highly tense, and presented a tympanitic sound, but there was no severe pain. Accordingly, the prolapsing portion of the omentum was cut off after applying a ligature to its neck, followed by an antiseptic dressing, and then the patient was ordered to take rest. Subsequently, the margin of the wound got slightly inflamed and an induration was felt in the corresponding part of the abdominal cavity. About June 9th, by means of pressure given to the inner and lower part of the opening of the wound some 200 grammes of thick pus with faeces were obtained. In spite of this, the tympanites now commenced to subside at this time, and by the middle of June it had even become considerably depressed. The appetite increased slightly and anaemia was detectable. By about the 23rd, the discharge of pus had remarkably declined, though some excrement was still to be found in the pus. This discharge of excrement, however, at last stopped about September 11th, leaving a small fistula, out of which a greenish black fluid escaped. Evacuation of the bowels now took place regularly once a day. The temperature lingered between 38°C. and 38.8°C. till June 21st. After that, it fluctuated for some time between 36.5°C. and 38°C. and then fell to normal on August 19th. Thus the patient left the hospital on October 4th. The number of days he spent at hospital was 127.

57. Blind Wound of the Left Lumbar Region, accompanied by Fracture of the

Spinous Process of the 4th Lumbar Vertebra and Fracture of the Right Ilium; Contused Wound of the Left Hypochondriac Region; Perforating Wound of the Left Inguinal Region; Blind Wound of the Left Iliac Region; Abrased Wound of the Left Shoulder; Blind Wound of the Left Thigh:—S. N., aged 26, a 2nd-class stoker petty officer on torpedo boat No. 68 of the 1st Flotilla. On the occasion of an attack made upon the enemy's fleet off Karasaki, Tsushima Island, on May 27th, 1905, he was on duty at the aft boiler, when at 9.20 p.m. he was injured in consequence of a hostile shell hitting the aft boiler room, and was placed in the Takeshiki Sick Quarters. On examination, he was found to have the following wounds:—(a) On the left side of the 4th lumbar vertebra, an oval wound 5 cm. long and 3 cm. wide, which was remarkably crushed both at the margin and bottom, and measuring 4 cm. in depth to the left and downwards. (b) In the left hypochondriac region, a subcutaneous hæmorrhage extending over area of the size of a palm, a swelling being noticed in the part. (c) At a distance of 4 cm. downwards from the anterior superior spine of the left ilium, an aperture of entrance 6 cm. in length and 3 cm. in width, which terminated in one of exit 4 cm. long and 2 cm. wide right above the left Poupart's ligament. In the inside of both apertures could be seen the pulsation of the femoral artery; and the fascia of the rectus abdominis was exposed. (d) Behind and above the aperture of entrance mentioned above was a blind wound about 2 cm. in diameter, which reached the muscle. (e) At the left shoulder was an abraded wound the size of a hen's egg. (f) At the middle one-third on the outer side of the left thigh there was an irregularly round aperture of a blind wound, the size of a little finger tip, which reached to a depth of 10 cm. The aperture of entrance and exit of wounds (c) and (d) were now partially sutured and aseptic dressing was applied, as with all the other wounds. Subsequently, wounds (e) and (f) were cured, each leaving a small cicatrix. The perforating wound of the inguinal region also gradually produced healthy granulation, and, becoming shallower and smaller, healed by the 7th of August. As for wound (a) in the left lumbar region, at its early stages, small fragments of bone, the size of rice-grains, were extracted from it, the diameter at the mouth measuring 3 cm.; a probe was introduced into it, and led along the posterior surface of the arch of the vertebra to the depth of 10 cm. to the inwards and downwards. The discharge of pus was very profuse, and the temperature oscillated at about 38°C.

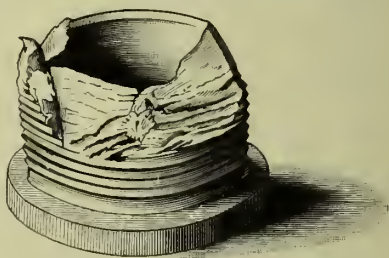


Fig. 11. Fragment of a base fuse extracted from the right psoas magnus of the stoker—case 57, the blind wound of the lumbar region extending to this point.

The part corresponding the right sacro-iliac joint was found a little swollen as compared with that on the left side, and gave a pain on pressure. The right thigh was flexed at the hip-joint, so that it could not be extended more than 150°. On our application, he had his lumbar region subjected to X-ray examination on board the *Saikio Maru*, but we were left in the dark as to the existence of any foreign body. The undulation of the temperature and discharge of pus continued as ever; accordingly, gauze was now replaced by a drainage-tube. Then, the flow of pus gradually decreased, the temperature fell remarkably, and appetite began to return. On August 18th, he was transferred to the Sasebo Naval Hospital. At that time, he was found to have tolerably good nutrition and constitution; the face was rather pale and looked a little tired. Although all the other wounds mentioned before were found cured, yet the blind wound of the lumbar region alone remained as a fistula through which a probe could be introduced to a depth of 12 cm. to the right and downwards. The temperature was remittent, and the discharge of pus was profuse. The X-ray examination made on the 28th revealed the existence of some foreign body inwards and upwards from the posterior superior spine of the right ilium. Therefore, on the 31st following, a skin incision was made on the right side of the lumbar vertebrae, and they took out, together with torn pieces of clothes and some powder residue, the base fuse of a 12 cm. shell, which measured 4 cm. both in length and width, and was 114 grammes in weight (see Fig. 11). By further examination of the surrounding part, it was discovered that the spinous process of the 4th lumbar vertebra was comminuted and that the crest of the ilium had sustained a cracked fracture. Consequent on the extraction of the foreign bodies, the temperature fell to normal, the appetite improved, and the pain abated suddenly. On September 12th, the patient was transported for the Yokosuka Naval Hospital on the *Nippon Maru*. At the time he had a horse-bean sized sore on the left side of the 4th lumbar vertebra. The granulation was soft, weak, and rather anæmic, having an aperture of a fistula at its middle part, in which was found inserted a small drainage-tube. A probe put into it sank to a depth of about 7 cm. Again, above the posterior superior spine of the right ilium, there was a granulating surface 7 cm. long and 4 cm. wide, near the middle of which existed an opening of a fistula with a somewhat large drainage-tube inserted into it. It was ascertained by sounding, that the wound was about 4 cm. in depth, and that it evacuated a slight quantity of pus. On September 23rd, the drainage-tube was removed, and iodoform gauze inserted instead. By the end of the same month, the pus had greatly decreased and the granulation became firm and red. Seeing, however, that the marked slowness of

healing process indicated the existence of some latent affection deep down, on the 29th, under influence of the general anaesthetic, a transverse incision was made along the fistula on the left side, so as to reach the region of the spinous process of the 5th lumbar vertebra, but no foreign body could be found. The fistula on the right side was cut in the same direction as had been done previously—that is, along the longitudinal diameter, and it was ascertained that a part of the crest of the ilium was separated; also the part of the bone deprived of the periosteum could be felt. Accordingly, another incision, 10 cm. in length, was given, taking the middle part of the iliac crest as the centre, and thus the fractured part being reached, the fragments of bone were extracted. Then an aseptic dressing was applied to the part. After that, the interior of the wound became very clean. By October 13th, one of the wounds on the right side of the lumbar vertebra grew to measure 7 cm. in length, and the other 5 cm., and that on the opposite side to measure 4 cm., and these three fistulae were found to communicate with each other beneath the muscle. Granulation slightly improved and discharge of pus also decreased. On January 22nd, 1906, a mixture of iodoform and glycerine was injected through the fistulae, which resulted in a sudden decline of evacuation of pus, and the fistulae were seen to grow smaller by degrees. On March 9th, the discharge of pus almost ceased, only that a slight quantity of thin serous fluid was being discharged. No grave impediment was recognized in walking and exercise. The fistulae were perfectly closed in a little over a month from that time; the patient's health was restored to its normal state, so that there remained no pain in the injured part nor any obstacle to movement. He left the hospital on the 11th of May. His case ran its course in 349 days.

SECTION VI. INJURIES OF THE UPPER EXTREMITY.

The injuries of the upper extremity numbered 43 cases of killed on the spot, 9 cases of subsequent deaths, and 6 of deaths at the hospitals. The actual cases of deaths caused by injuries of the upper extremity alone were however only one killed on the spot (death being attributed to the bleeding consequent upon compound fracture at the right shoulder joint), 2 subsequent deaths (one having the right upper arm blown off, the other from a contused wound of the right shoulder and upper arm), and 1 in death at hospital, which was a case of compound fracture of the humerus, attended by a wound in the soft part of the other upper arm. All the other cases of deaths in which the upper extremity

was involved, were cases which accompanied mortal wounds of the head, chest, abdomen, or the lower extremity. Cases of injuries received by those who had in consequence to be invalided, and by those who were wounded less severely than the above, and resulted in complete recovery, totalled 662 (excepting always other complicating injuries); and this 662 bears a ratio of 29.19 per cent. to 2,268, the total number of injuries which ended in recovery. The total number of injuries of the upper extremity, in consequence of which the recipients had to be invalided, was 52, occurring to 44 persons, of whom 4 were wounded in the shoulder, 21 in the upper arm, 15 in the forearm, and 4 in the hand: all the other injuries of the upper limb always accompanying those of the chest and abdomen. The chief causes for invaliding were loss of the arm, forearm or hand in consequence of mutilation, disarticulation or amputation; shortening of the limb from wounds in the epiphysis of bones; impairment of movement from wounds in the joint; and paralysis of the ulnar nerve. We shall now give eleven cases of principal wounds sustained in the upper extremity (with their clinical history) and, for the sake of comparison, two which occurred to Russians.

58. Contused Wound of the Left Shoulder, attended by Fracture of the Scapula; Lacerated Wounds of the Palm of the Left Hand, and of the Right Side of the Back; and Abrased Wound of the Left Upper Arm:—S. S., aged 22, an able seaman on the *Fuji*. During the engagement outside Port Arthur on February 9th, 1904, he was at work by the side of port No. 4 6-inch gun on the upper deck, when at 12.15 p.m., he was injured by fragments of a hostile shell which then struck the stanchion of the fore-bridge and burst. On examination, (a) at the outer half of the spine of the left scapula was found an oval contused wound 7 cm. long and 4 cm. wide, which extended to both supra- and infra-spinous fossae. Outside, the wound had a sharp margin, and inside, it was found to penetrate somewhat deeply so as to break the lower part of the bone, and it also comminuted the larger part of the spine of the scapula, and at the bottom was a thin iron-fragment, crooked, and of the size of a walnut, attended by hæmorrhage. (b) In the left palm, running upwards from the interphalangeal space between the index and middle fingers existed a lacerated wound 2.5 cm. in length, which reached down to the muscles and at the same time caused a part of the nail of the index finger to separate from its matrix. (c) In the back, close by the spinous process of the dorsal vertebra and on the inner side of the lower angle of the right scapula, was found a wound of the size of a little-finger tip. (d)

Lastly a thumb-head-sized abraded wound was discovered at the upper part of the left upper arm. The iron-fragment and the splinters of the fractured bone were extracted; dry gauze was inserted into the aperture, the lacerated wound in the palm was sutured, and then the wounds were dressed. Thus, that night the temperature rose to 38.2°C. On the 11th, the patient was sent to the Sasebo Naval Hospital on the *Genkai Maru*. On the 13th following, he was received at the Hospital. On examination there, the wound of the left shoulder was of the size of a goose-egg, the pus discharged having an offensive smell, and at the bottom of the wound, fragments of the fractured spine of the scapula could be felt. All the other wounds likewise presented signs of suppuration. Accordingly, each wound was treated antiseptically, and in consequence, the contused wound of the right back and the abraded wound of the left upper arm healed towards the end of February. Out of the bottom of the wound of the left shoulder, separated fragments of the bone were repeatedly taken, and by March 17th, the wound had contracted into half the size it had been at the time when the patient was admitted to the hospital. On the 20th, he was transferred to the Kure Naval Hospital. At that time, in the left shoulder was found a semilunar wound, 5 cm. long and 3 cm. wide, with a firm granulation and slight discharge of pus. Its upper and lower corners had each an orifice of a fistula left, of which the upper one had a depth of 3 cm. inwards and downwards, and the lower one, a depth of 2 cm. inwards and downwards. A probe introduced into the lower fistula touched a rough surface of fractured bone, and both fistulae were ascertained to hold communication with each other at a deep part. By due treatment, these wounds became gradually contracted, and out of the lower fistula small pieces of bone were extracted several times. On April 10th, he suddenly felt a chill and the temperature rose to 39°C. Accordingly, on the 12th, under the influence of general anæsthetic, the aperture of fistula was enlarged upwards and downwards. By this operation it was discovered that the larger part of the spine was lost and that the supraspinous fossa had a small defect in the shape of a hole, which, taking its course inwards, finally formed a cavity at the lower part of the scapula, in which pus and small sequestra were found lodging. After this operation, the pus discharge declined, but a new pain appeared at the upper part of the internal border of the scapula, and there was no sign of the fistula closing. On June 10th, an incision was given to the painful part mentioned above, so as to reach the inferior part of the scapula, and through this there came out some small sand-like sequestra which had remained within. As a result, the discharge of pus ceased by degrees and the fistula was entirely closed on August 10th, the cicatrix growing harder day by day. On September 3rd,

the depression at the middle of the cicatrix presented a fluctuating area of the size of a thumb-head. This was incised and duly treated at once, which effected its cure on the 20th. On the 22nd, however, a fluctuating area re-appeared. This was opened again, and a fistula, measuring 7 cm. in depth, was found, which lingered long without healing. On November 4th, under the influence of the general anæsthetic, incisions were given to the old fistule and it was ascertained that the small-finger-sized hole of the bone in the supraspinous fossa was still holding communication with the large granulating tissues existing at the space between the internal angle of the scapula and the rib, with a sequestrum 2 cm. long and 1 cm. wide lodging within, which was now extracted. Then the fistula was scraped and a drainage-tube introduced. The wound subsequently took a favourable course and was finally filled up with granulation. By the 23rd of December the wound had accomplished scabbing and was completely healed. However, for the reason that the scapula had become adherent to the thoracic wall by cicatrization, and that as the result the movement of the left shoulder-joint was impeded so as to disable him for active work, the patient was dismissed from service for life and left the hospital on the 24th of January, 1905. His case took 350 days in running its course.

59. Blind Shrapnel Wound of the Right Clavicular Region, attended with Injury of the Clavicle; and Perforating Wound of the Left Knee-joint:—K. H., aged 31, a 2nd-class petty officer belonging to the Naval Heavy Gun Brigade. While shelling the Russian fortress at Wan-kia-tun from West Chu-chuan-tze-kow on July 26th, 1904, he was injured by a shrapnel at 11.17 a.m. (*a*) At the external one-third of the right clavicle was found an aperture of wound about 3 cm. wide with a depth of 4 cm. outwards and downwards, at the bottom of which the clavicle was recognized to have an incomplete fracture, a part of the bone being comminuted. (*b*) At the interior portion of the upper margin of the left patella was an aperture of entrance of the size of a horse-bean, accompanied by an aperture of exit of a similar size lying on its frontal and interior side, both communicating with each other under the skin. After first-aid, the patient was, that same day, sent to the field hospital of the 11th Army Division, and after receiving treatment at the dépôt hospital at Dalny, was transferred to the Sasebo Naval Hospital on August 6th. At that time, movable fragments of bone were recognized to exist at the injured part of the clavicle which, however, it was difficult to extract as they kept connection with the periosteum. Also owing to a lightning pain existing in the area supplied by the ulnar nerve, which would aggravate if the injured limb were moved actively or passively, the limb had to be left still. The apertures of the wound of

the left knee discharged pus copiously. On the 9th, an X-ray examination was made, and a shrapnel shot was ascertained to be lodging at the lower part of the head of the right humerus. Accordingly, under anaesthetic, a skin incision, 8 cm. long, was made along the middle of the front side of the upper arm, starting at a part 3 fingers' breadth below and inside the coracoid process, and thus the lower margins of the pectoralis muscles being lifted, the incision was advanced layer by layer from the inner margin of the biceps to the humero-scapular joint; and the capsular ligament was opened. Here a shrapnel shot was felt, so tightly inserted into the bone tissue midway between the surgical and anatomical necks at the back of the inner surface of the humerus, that it could not be taken out and had to be left where it was. The operation wound was sutured, except in the middle, and a new incision was made to the aperture of entrance at the outer end of the clavicle, to a length of 8 cm., and some fragments of the fractured bone were removed from the wound. Then it was sutured except 4 cm. at the middle. This day the temperature rose to 39.2°C. and the first sign of inflammation of the left shoulder-joint was perceptible, which, however, abated under treatment. About September 16th, the aperture of entrance had completely closed. Prior to this, the wound of the left knee had formed a complete cicatrix, and the operation wound in the right axilla had contracted into a small ulcerous surface. The right shoulder-joint, however, had a derangement left, so that the right upper arm could not be raised higher than the horizontal line. On December 12th, the patient was transferred to the Yokosuka Naval Hospital. At that time, at the outer extremity of the right clavicle was a granulation surface some 2 cm. in length, which, in consequence of due treatment, healed before long. After this, a foreign body was felt to exist under the skin on the anterior-exterior side of the lower end of the left thigh, and a rice-grain-sized shell-fragment was extracted by means of a small incision. The wound by this operation healed by primary intention, but on account of an obstacle of movement caused to the shoulder-joint, the patient was dismissed from service and left the hospital on January 23rd, 1905. His case took 181 days in running its course.

60. Wound with Loss of Soft Tissues of the Right Upper Arm, accompanied by Comminuted Fracture of the Humerus; and Perforating Wound of the Back:— G. I., aged 23, a 2nd-class stoker belonging to No. 67 torpedo boat of the 14th Flotilla. While the boat was engaged in picking up the crews of the block ships on the 3rd blocking attempt of Port Arthur on May 5th, 1904, he was injured at 2:20 a.m. by a hostile shell that struck the aft conning tower. After receiving first-aid on the boat, he was removed to the *Asama*,

and on the next day (the 4th) he was examined on the *Kasuga Maru*, when he was found to have, firstly, a wound with loss of soft tissues, 17 cm. long and 13 cm. wide, extending from the middle of the posterior surface of the right upper arm to the elbow-joint; the skin and the superficial layers of the muscles having been removed, and the lower extremity of the humerus comminuted. Secondly, in the region of the 9th rib on the right posterior axillary line, was an aperture of wound 3.5 cm. in diameter, which through a wound canal of 6 cm. terminated in the other aperture of wound about 2 cm. in diameter in the region corresponding to the inferior angle of the scapula. There was no fracture attending. Accordingly, aseptic dressing being applied to the wounds, the patient was sent to the *Saikio Maru* on the 5th. In the ship, under anæsthetic, the resection of the humerus was performed in the part 2 cm. above its trochlea, and out of the wound sloughed soft tissues were removed. A part of the wound by the operation was sutured and hypodermic injection of saline solution followed. On the 9th, the patient was transferred to the Sasebo Naval Hospital. At that time, he was found greatly debilitated and distress could be read in his countenance. The skin and muscles on the inner and posterior sides of the lower half of the right upper arm, and those of the inner half on the anterior side of the same were found heavily destroyed. The surface of the wound now measured 24 cm. in total length and 19 cm. in width, as it had been enlarged in order to resect the lower extremity of the humerus. The pus discharge from it was very copious and offensive. In the area supplied by the right ulnar nerve there was paralysis. Under certain treatment given after that time, the perforating wound of the thoracic wall was completely healed by June 10th. As to the right upper arm, it was utterly hopeless to preserve it, so it was amputated on the afternoon of May 10th. The sutured wound healed by primary intention; the inner and outer angles of the stump at first evacuated pus, which, however, abated gradually, and by the end of August the whole stump was satisfactorily cured by cicatrization. On September 6th, the patient was sent to the Yokosuka Naval Hospital, where he was fitted with an artificial arm, and dismissed from service for life, leaving it on December 23rd. The days spent in the hospital were 173.

61. Blind Wound of the Right Axilla; Wound with Loss of Soft Tissues of the Right Upper and Forearm; Blind Wound of the Right Forearm accompanied by Fracture of Ulna; Blind Wound of the Right Forearm; and Contused Wound of the Right Thigh:—J. K., aged 18, a first class boy on the *Asama*. During the engagement in the neighbourhood of Okinoshima, on May 27th, 1905, he was at work serving the light gun on the poop deck in the aft of the ship, when

at 3.10 p.m. he was injured by a hostile shell. On examination, (a) at the outer edge of the posterior wall of the right axilla was found a little finger-tip-sized wound, 7 cm. in depth, and penetrating the soft part towards the median line of the axilla. (b) On the inner side of the right upper arm, an irregular-shaped wound with loss of soft tissues, 20 cm. long and 10 cm. wide. The superior border of the wound reached the upper one-third of the upper arm, the anterior somewhat outward of the median line on the front side of the upper arm, the posterior reaching the median line on its back side, and the inferior, the upper part of the front surface of the right forearm. The muscles at the bottom of the wound were lacerated, attended by hemorrhage. (c) At the upper part of the anterior surface of the right forearm was a hen's egg-sized contused wound; the soft part was damaged, and fracture of the ulna was felt. Besides, on the anterior surface at the lower extremity of the right forearm existed a wound about 3 cm. wide. (d) In the region of the great trochanter of the right thigh was found an oval flap wound of skin situated sidelong and measuring 13 cm. in length and 5 cm. in width. The base of the flap was situated anteriorly; the surface had a large part of the fascia exposed and at several places the muscles could be seen. Each wound was dressed antiseptically, and a splint was applied to the right forearm. In this state, the patient was sent to the Maidzuru Naval Hospital. At that time, the right upper limb was found swollen over from the shoulder down to the forearm, attended by pain. The right elbow-joint was bent with a flexion of about 130°. The fingers of the right hand were flexed, and the all wounds already presented signs of suppuration. The X-ray examination showed that the right ulna had an oblique fracture at the lower limit of its upper one-third, the fragments being found overlapping each other; also, that a little upwards from the right wrist-joint and on the ulnar side, a round flat foreign body with the diameter of about 2.7 cm. was lodging, while another thumb-head-sized one was discovered within the wound in the right axilla. Accordingly, by an incision at the axilla, a thumb-head-sized rivet was extracted. Until the end of September, small pieces of woollen cloth came out of the wound at intervals, and it was not until the beginning of January of the following year that the wound was completely closed. The wounds (b) and (d) gradually advanced from granulation to cicatrization and healed previous to the cure of wound (a). Wound (c), i.e. the fracture of the ulna presenting a little overlapping of the fragments, performed union by the beginning of August, followed by closure of the aperture of the wound. Owing, however, to the total loss of the function of the ulnar nerve, the right upper limb became greatly atrophied in the forearm—especially in the hand. The forearm getting stiffened at the position of pronation could not supinate, and

the right upper arm was prevented from being raised to the normal limit. The right elbow was also impeded in flexion and extension; the right hand presented a claw-hand, and in addition to this, the right ring finger and little finger were numb. Such being the case, the patient was invalided and left the hospital recovered on the 16th of March, 1906. His case took 293 days before he left the hospital.

62. Contused Wound of the Right Upper Arm, accompanied by Fracture of the Humerus; Contused Wound of the Right Back; and Contused Wounds of the Back of the Right Hand and the Right Thigh:—G. H., aged 25, a leading seaman on the *Adzuma*. During the engagement near Okinoshima on May 27th, 1905, he was at work as a gunner's mate, when, at 4.25 p.m., he was injured by the side of No.6 6-inch gun on the port side amidships on the upper deck by some shell fragments and indirect projectiles. On examination, he was found to have (a) in the posterior side of the upper arm an oval contused wound, 23 cm. in length and 10 cm. in width. The triceps was found lacerated, and the lower extremity of the humerus had sustained comminuted fracture, its lower fragment

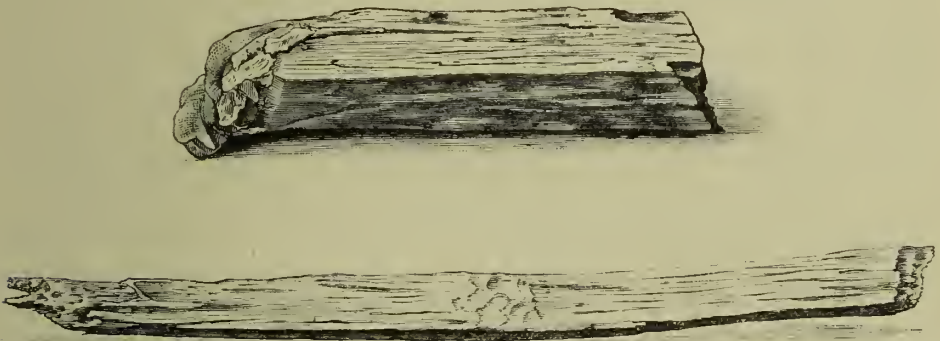


Fig. 12. Wooden splinters extracted from the wounds of the right upper arm and of the back of, the patient—case 62. Actual size.

protruding from the wound. (b) At the middle of the back of the right chest existed an irregularly triangular contused wound, 12 cm. in longitudinal and 11 cm. in transverse diameter, in which the latissimus dorsi and infraspinatus were exposed, the superficial layer of the muscles being destroyed. (c) The back of the right hand was found to have sustained a transverse contused wound, 5 cm. long and 3 cm. wide, and a lacerated wound 4 cm. in length and 1 cm. in width, existed running from the middle of the lower margin of the last wound obliquely towards the 5th metacarpo-phalangeal joint, in which, however, no abnormality was detected either in the tendons or the bones. These three wounds

were all attended by heavy bleeding, and the irregular margins presented a smoky colour attributable to the effect of gunpowder, as powder residue and numerous tiny pieces of wood were seen driven into the wound. (*d*) On the outer side of the right thigh were four wounds some large and some small; one of them situated at the upper one-third of the thigh was oval in shape and measured 4 cm. in the longitudinal and 3 cm. in the transverse diameter. The other three at the middle one-third of the thigh each measured 2 or 3 cm. in diameter, and 3 cm. in depth, each retaining an iron-fragment at its bottom. The wounds were now first cleared of foreign bodies, then wiped clean with a cloth moistened with carbolic acid solution and had bandages applied. To the right upper arm, a zinc splint was applied. The patient was then ordered to take rest. That night hæmoptysis occurred several times together with coughing, and a pain was complained of in the chest, which, however, stopped on the 28th following. On the 30th, he was conveyed to the Sasebo Naval Hospital. That very night, the wound (*a*) was cleansed with sterilized water, followed by the removal of free pieces of bone. Then the muscles were sutured, and antiseptic dressing was applied. Subsequently, the sutured part got mortified, accompanied by copious discharge of pus. So, on June 4th, the ligatures were removed and the wound treated open. The wound (*b*) in the right back having started on a favourable course became a palm-sized granulating surface by June 16th. The wound (*a*), he it remarked, had a fistula left at the fractured part, and pus was stagnating between the muscles at the lower extremity of the right upper arm, but the larger part of the wound had become a granulating surface and the pus flow had also markedly subsided. On June 25th, continuous traction was applied to the right upper arm; and skin grafting to the wounds (*a*) and (*b*). As a result, both became considerably smaller. The wounds (*b*) and (*c*) accomplished perfect cicatrization, the former by July 14th, and the latter by September 5th. The wounds (*d*) of the right thigh had healed before these, without leaving any evil consequence behind. However, the fistula of the right upper arm still remained unhealed, sending out tiny bone pieces occasionally, so that even in October sequestra were discharged. The result was that too much space having been produced between the two fragments they showed no inclination to perform union. To return to the fistula mentioned before, it closed and healed by November 5th; accordingly, a plaster of Paris bandage was applied to the injured part in order to secure its immobilization and to attain the union of the fractured part, but the purpose was frustrated owing to the ankylosis of the right elbow-joint, and at last a false joint was formed at the upper

one-third of the upper arm. The patient was invalided and left the hospital on February 22nd, 1906. The days' treatment was 271.

63. Blind Wound of the Elbow-Joint, attended by Fracture of the Humerus; Blind Wound of the Right Thigh; Contusion of the Right Thigh; Blind Wound of the Right Leg; Explosion-Wound of the Right Leg; Contused Wound of the Right Forearm; and Abrased Wound of the Right Forearm:—C. O., aged 30, a chief stoker petty officer on the *Yashima*. While laying submarine mines outside of Port Arthur on board *Uwajima Maru* No. 3, he was wounded by a hostile shell at 1.20 a.m. on May 30th, 1904. On examination, it was found (*a*) that the left elbow-joint was remarkably swollen and there was a walnut-sized contused wound in the region of the internal condyle. It had its margin crushed with a wound orifice at the middle. The internal condyle and a part of the trochlea of the humerus were comminuted. A probe introduced into it was led obliquely downwards and outwards so as to reach the middle of the upper one-third of the left forearm, where there existed a heavy swelling and pain. (*b*) A little below the upper boundary of the lower one-third on the exterior side of the right thigh was found a contused wound the size of a sparrow's egg. Its middle part formed an irregularly round wound orifice of the size of a bean, which, running obliquely upwards and inwards, sank to a depth of 3 cm. (*c*) In the area of the size of a palm above the last wound were seen numerous ecchymoses of the size either of a linseed or of a little finger-tip. (*d*) On the superior boundary of the upper one-third on the outer side of the right leg was a contused wound, 1.5 cm. in length and 0.5 cm. in width. Its upper part was found forming the bean-sized aperture of wound which, taking its course upwards, sank to a depth of about 3 cm. (*e*) Extending from the middle of the upper one-third of the right leg over its lower boundary existed a dozen or more explosion-wounds either of the size of a linseed or of a little finger-tip, the majority of which generally presented a black colour at the centre, with margins slightly swollen. (*f*) On the lower boundary of the upper one-third of the back of the right forearm was a contused wound longitudinally laid, 1 cm. in length and 0.5 cm. in width. (*g*) Below the wound (*f*) were seen several abrased wounds. All the wounds were cleansed, followed by application of the aseptic dressing. The patient was, the same day, sent to the *Kobe Maru*. Here, many tiny pieces of clothes and smashed bone were extracted from the wound (*a*) of the left elbow-joint; an incision, 2 cm. in length, was made into the blind end of the track of the wound (*a*), that is, the upper one-third on the anterior side of the left forearm, and a little finger-tip sized irregularly-square fragment, found lodging in the fibres of the flexor profundus digitorum, was extracted. Then the wound (*d*) on the upper boundary of the upper one-third

of the exterior side of the right leg was incised, and out of it was taken a rice-grain-sized irregularly-round shell-fragment. Each of the wounds mentioned above was now dressed aseptically. Subsequently, the left forearm was affected with an extensive inflammation of cellular tissue everywhere below the elbow-joint. Accordingly, the middle of the same forearm was incised on its ulnar side to facilitate pus discharge. On June 11th, an irregularly-square shell-fragment of the size of a finger-tip was extracted from the wound at the elbow-joint, and on the 16th, a piece of flannel, 1.5 cm. square, from the operation wound on the ulnar side. After this, the wounds were steadily developing firm granulations and becoming smaller. On July 20th, the patient was removed to the Sasebo Naval Hospital. At that time, the left elbow-joint was fixed at a right angle and the left forearm in the position of pronation. There were found wounds: one, 4 cm. long and 3 cm. wide, in the region of the internal condyle of the left humerus, one, 4 cm. long and 2 cm. wide, at the upper one-third of the anterior surface of the forearm; one, 3 cm. long and 1 cm. wide, at the middle of the ulnar side of the left forearm; and one, of the size of an index finger head, on the outer side of the head of the fibula of the right leg. All the rest of the wounds and contusions were found already cured. By due measures of treatment given, the remaining wounds were also healed by cicatrization. As the paralysis of the ulnar nerve remained and the hypothenar eminence and the interossei became emaciated, a longitudinal skin incision, with the internal condyle of the humerus for its centre, was made on September 27th, and the separated ends of the same nerve caught in the cicatricial tissues were sought out and made free. Then a nerve suture was performed. The operation wound healed by cicatrization. On December 9th, the patient was transferred to the Kure Naval Hospital. At that time, the elbow-joint could be extended only to 130° , and be flexed to 60° ; on the ulnar side of the forearm existed a palm-sized area with dull sensation; the interossei and the hypothenar eminence were emaciated; the ring and little fingers had a dull sensation—the former on the ulnar side of its palm and back, and the latter on both sides,—and the grasping power indicated 11 kilogrammes. Electric bath, massage, and every other means failed to cure the numbness in the lower part of the left elbow-joint. The ring and little fingers became flexed to a position of some 100° , so that they could not be extended. In consequence, the patient was dismissed from service and left the hospital on the 31st of March, 1905. His case took 305 days in running its course.

64. Perforating Wound of the Left Upper Arm, attended by Comminuted Fracture of the Humerus; Contused Wound of the Left Thoracic Wall; Lacerated Wound

of the Neck and Blind Wound of the Left Thoracic Wall, attended by Lacerated Wound of the Auricle, Fracture of the Right Clavicle, and Fracture of a Rib; Abrased Wounds of the Right Breast, Epigastrium, Shoulder, Upper Arm, and Right and Left Forearms; and Compound Fracture of the Left Middle Finger:— A. S., aged 28, a Russian seaman on the *Rurik*. During the Battle of Ulsan on August 14th, 1904, he was injured on the ship, and received first-aid from a surgeon belonging to our 2nd Squadron. Admitted into the Sasebo Naval Hospital on the 15th following and being examined, he was found to have the following wounds. (a) In the anterior wall of the left axilla was an aperture of a wound, 3 cm. in diameter, which terminated in another aperture of about the same size located at the lower part of the deltoid muscle on the outer side of the left upper arm. A part of the wound was found sloughed, and along the wound track the lower part of the surgical neck of the humerus was found comminuted and a part of the pectoralis major, the deltoid, the biceps, and the triceps, crushed. (b) In the anterior surface of the left chest, in the 2nd intercostal space was a contused wound 4 cm. in length and 2 cm. in width, by which the pectoralis major was crushed. (c) There was a contused and lacerated wound, 21 cm. in length, which started from 7 cm. above the mastoid process of the right temporal bone, and, descending perpendicularly behind the ear and over the right neck, reached a part 3 cm. above the clavicle. Again, just above the right clavicle and parallel with the bone existed a blind wound, with an aperture 2.5 cm. wide; and in the right auricle was a narrow lacerated wound. These three wounds were considered to have been caused by a single shell-fragment. (d) Almost numberless abrased wounds or small contused wounds were found in the anterior thoracic wall, epigastric region, right scapular region, right upper arm, right and left forearms. (e) The 1st phalanx of the left middle finger had a compound fracture. All the above-mentioned wounds were dirty and presented signs of inflammation. Accordingly, on the 16th, under general anaesthetic, the wound (a) was enlarged upwards and downwards by a length of about 10 cm. so that the fractured extremity of the upper fragment of the humerus was laid bare. Seeing that this was comminuted so seriously that it could not well be preserved, it was excised at the shoulder-joint. Then, the fractured extremity of the lower fragment of the bone being sawed off by a length of 3 cm., an incision was made extending from the middle of the operation-wound to the wound (b) in the left anterior chest, so that the wound now presented a cross shape; and a couple of small bone pieces were extracted from the pectoralis major. These pieces were probably fragments of the shattered humerus which had been displaced thither. Next, the sounding into the aperture of entrance lying above the right clavicle showed that the wound track, after comminuting the middle one—

third of the clavicle, had advanced farther downwards into the muscular substance of the thoracic wall. Hereupon, a transverse incision, 4 cm. long, was made in the 2nd intercostal space, and a finger introduced through it revealed that the lower border of the 2nd rib was slightly broken, and that the whole had formed a cavity in the thoracic wall. From the inner side of the right mammary line in the 3rd intercostal space was obtained an irregularly square iron fragment 3 cm. long

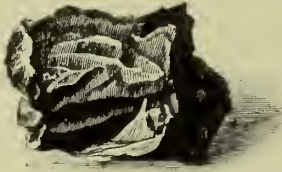


Fig. 13. The shell fragment extracted from the right third intercostal space of the patient case 64. The white zone on its under surface shows the fine fibres of white cloth sticking.

2.7 cm. wide, 1.8 cm. thick, and weighing 33 grammes (see Fig. 13). This fragment, starting from the posterior-superior part of the temple, had inflicted a long lacerated wound along the neck cutting off a portion of the auricle, and above the clavicle it penetrated into the thoracic wall. Several broken pieces of the clavicle were taken out of the wound. As regards the wound (*c*), the 1st phalanx as well as the soft tissues of the left middle finger thereabout were heavily crushed,

and so the finger was amputated at the metacarpo-phalangeal joint. In spite of due treatment given to all the wounds above named, the wounds (*a*) and (*b*) became suppurated,—especially in the blind bottom in the right thoracic wall, where pus accumulated. Accordingly, a new incision was made in the 3rd intercostal space, and out of the old wound located in the 2nd intercostal space as well as out of the aperture of wound above the clavicle, were repeatedly extracted fractured pieces of the clavicle. The wound of the head healed by September 24th. The wound surface on the auricle was covered with scab by October 23rd. The incision wound in the anterior side of the left chest took a favourable course, and formed a cicatrix by October 30th. The wound of the left upper arm and the scapular region was healed on November 16th by cicatrization. The bandage was, therefore, removed and replaced by a leather-band. Secured in this way, the left upper arm was now capable of performing its movements. The wound of the right clavicle still remaining as a fistula 10 cm. in depth, continued to evacuate pus much longer. A probe introduced into it reached the superior border of the 4th rib, touching a rough surface of the clavicle on its way. In this condition, the patient was transferred to the Prisoner's Quarters at Matsuyama on December 17th. He stayed in the hospital for 124 days. Refer to photograph (64).

65. Perforating Wounds of the Right Scapular Region and the Upper Arm, accompanied by Comminuted Fracture of the Humerus; and Contused Wound of the Right Thumb:—D. E., aged 28, a Russian leading seaman on the *Ostlyabya*:—When the

CICATRICES ON RECOVERY.



WOUNDS ON THE LEFT UPPER
ARM, AND ON THE CHEST.



S. A. SEAMAN. *RURIK* (RUSSIAN WARSHIP). LACERATED WOUND
ON THE RIGHT SIDE OF THE NECK, PENETRATING WOUND OF
THE CHEST WITH FRACTURE. (64.)



Osyabya was sunk in the course of the battle of the Japan Sea on May 27th, 1905, he jumped into the sea, and, after floating about for some forty minutes, was picked up and on the 28th was transferred to the *Dmitri Donskoi*, on board which he is said to have been injured about 8 p.m. that day. On the 31st, he was conveyed to the Sasebo Naval Hospital on the *Kasuga*. On examination, he was found firstly to have an irregularly round open wound, 10 cm. in diameter, which, extending from directly below the outer extremity of the right clavicle occupied the larger part of the anterior wall of the axilla. The wound, the inner margin of which was partially extroverted, formed a long canal, terminating in another irregularly round wound of a similar size, which occupied the part extending from the upper part on the back of the right upper arm to the scapular region.

The latter was probably the aperture of exit corresponding to the former, which was the aperture of entrance. On its way, it had comminuted the upper extremity of the humerus and the upper one-fourth of the shaft of the same bone. Sloughed pieces of tissues and fragments of the bone were recognized to exist in the wound; in the right thoracic wall was found subcutaneous emphysema, attended by extravasation in its margin. Besides, in the thenar eminence of the right hand there existed a contused wound 4 cm. in length and 1.5 cm. in width. At this period, the temperature indicated 39.2°C. The wound of the right thenar eminence was sutured; and the sloughs were removed from the perforating wound and the bone fragments extracted. Consequently the wound track grew cleaner by degrees, emphysema disappeared, extravasation absorbed, and the exit, as well as the entrance aperture, became gradually obliterated by granulation. On June 15th, an incision, 7 cm. in length, was made, from the outer margin of the entrance aperture to the anterior-interior side of the upper extremity of the upper arm, and thus numerous broken pieces of bone which had remained in the wound were removed. Then the sharp end of the fractured humerus was sawed off. After this operation the healing progressed favourably; the temperature fell to normal by the middle of July; and at the end of the same month the apertures of both exit and entrance became as small ulcers as a bean and a pea respectively. A probe introduced into both wounds reached the shoulder-joint. These fistulae having entirely closed by September 29th, the injured region was subjected to X-rays-inspection, which showed that the callus was formed, filling the gap between the two fragments of the humerus and that they united at the insertion of the pectoralis major. This part was already hard to the touch, and it was ascertained that the union was performed with a slight angular displacement, and, though powerless, the shoulder-joint admitted

of movement; the function of the right elbow-joint also had been to a certain degree restored. Completely recovered, he was allowed to leave the hospital, on October 6th. He had remained in hospital for 128 days.

66. The Left Forearm Blown off:—S. K., aged 24, a leading seaman on the *Idzumo*. During the naval battle of Ulsan on August 14th, 1904, he was employed as a messenger and at 9.55 a.m. he was standing erect, with the voice-tube in his right hand and the megaphone in his left applied to his mouth and was giving range notice when a 6-inch shell pierced through the junction of the upper deck and the hammock netting, blew off both the legs of a leading seaman, and then, turning slightly upwards, hit and blew off the patient's forearm, at the same moment breaking the megaphone which he held in his hand. On examination, the left forearm was found entirely blown off at the upper one-third and some 7 cm. below the elbow-joint. The skin at the mutilated extremity was severed on the anterior side, 3 cm. below the elbow-joint, and on the posterior side, 6 cm. below the same joint. The fractured extremity of the ulna was exposed to a length of 6 cm. The radius was lost below the neck, leaving only about 4 cm. of the shaft behind. The elbow-joint was dislocated and the muscles at the upper part of the left forearm were irregularly mutilated, and bleeding was copious. So the remainder of the forearm was exarticulated at the elbow-joint, and the stump after having been sutured, received an aseptic dressing. Thus the patient was transported to the Sasebo Naval Hospital on the 15th following. At that time, the stump of the left upper arm had a Y-shaped suture; and pus was found to be escaping from the inserted drainage-tube.

In the course of due treatment, the sutured margins of the wound became black and mortified, and so the ligatures were removed and the mortified tissues cut away, followed by the washing of the part with corrosive sublimate solution and by application of iodoform gauze. Thereafter, the wound took a favourable course and developed healthy granulation, the pus discharge steadily subsided, and the formation of cicatrization going on by degrees, the wound was healed in time. On October 19th, the patient was transferred to the Yokosuka Naval Hospital. At that time, the amputated stump of the left upper limb was found completely cured, only the arm being remarkably emaciated, as compared with that on the right side. Fitted with an artificial limb which H. M. the Empress graciously conferred upon him, the patient was invalided and left the hospital on January 28th, 1905. His case required 167 days in running its course.

67. Wound attended with Loss of Soft Tissues of the Forearm:—E. S., aged 22, a 2nd-class stoker on board the *Yakumo*. During the engagement of the Yellow Sea on August 10th, 1904, being in the 4th compartment, on the starboard

side amidships on the main deck, he was injured by a hostile shell. On examination, he was found to have a deep wound, 6 cm. long and 5 cm. wide, attended with loss of soft tissues on the anterior side of the right forearm, a little above the wrist-joint and inclining towards the ulnar side. The surface presented a dark colour, and, the ulnar artery being broken, there was profuse hæmorrhage. Accordingly, the brachial artery was ligatured and an aseptic dressing was applied to the part; then the patient was at once removed to the *Saikio Maru* on the 12th, and, on the 14th following, was conveyed home to the Sasebo Naval Hospital. Examination made at that time showed that the wound with loss of soft tissues of the forearm had a portion of the ulnaris internus and the flexor digitorum sublimis, and the nervus ulnaris, the ulnar artery and vein crushed, but the ulna itself was recognized to be quite intact. At the time of the patient's admission to the hospital, there was no sign of inflammation around the wound. The right hand fingers, except the thumb, were found to be in the position of half-flexion and to be considerably obstructed in both extension and flexion movements. On both sides of the little finger, and on the ulnar side of the ring finger, there was anæsthesia. In the course of treatment given at the hospital, the operation wound produced by the ligature of the brachial artery at the upper one-third of the anterior side of the right upper arm healed by August 22nd. The wound of the forearm began to show auspicious signs: the granulating surface was becoming smaller and smaller, with cicatrization steadily proceeding from the margin, so that by September 4th, the area of the surface measured only 4 cm. in length and 1 cm. in width, and the pus discharge became very slight. On the 10th, the patient was again transferred to the Yokosuka Naval Hospital. At that time, the right forearm had a small ulcer at the middle of the former wound; the wrist-joint could scarcely perform extension and flexion, owing to rigidity caused by disuse. The right hand had lost its grasping power and presented claw-hand accompanied by the restriction of pronation and supination of the forearm, and the palm and the back of the hand had anæsthesia on the ulnar side. By the 22nd of the same month, the ulcer was healed, and pronation and supination were restored to normal. However, the anæsthesia remained as ever, and not only was the movement of the metacarpo-phalangeal joints still restricted but the phalangeal joints could not be extended at all. For these reasons, the patient was dismissed from service for life and was allowed to leave the hospital on January 23rd, 1905. His case took 166 days in running its course.

68. Blind Wound of the Left Forearm (traumatic aneurism of the radial artery), and Abrasion of the Same:—T. A., aged 23, a leading signalman on the *Mikasa*.

During the engagement off Shan-tung Promontory on August 10th, 1904, he was at work on the fore bridge, when at 6.30 p.m., a hostile shell hit the semaphore at the left end of the bridge, and burst. At that moment, he received three injuries 7 cm. above the wrist-joint, on the anterior side of the left forearm. When he was receiving first-aid at the fore dressing station, arterial blood came gushing out of the deepest of the wounds. Accordingly, in addition to the dressing of the wounds, a tourniquet was applied to the upper arm. By the time his turn came to receive treatment again in the operation room after the battle was over, the bleeding had already stopped, and it was found that there existed only a single blind wound, with a sharp margin and reaching the subcutaneous cellular tissue, while the abrasions were nothing more than superficial injuries in which the corium was dottedly exposed. The former wound was now stuffed with sterilized gauze, the others were wrapped with gauze moistened with aqua plumbi. By treatment given thereafter, the abrasions healed in a short time, and the blind wound also developed granulation and healed, leaving a dark-red cicatrix behind. However, the skin at that part was still slightly swollen, and the patient complained of the existence of dull pain on pressure along the radial artery down below that part, accompanied by the existence of anaesthesia on the outer margin of the back of the thumb. Owing, however, to the fact that the wound surface was cured, the patient was considered as completely recovered and was sent back to his ship on August 26th. Unfortunately, the local swelling that was expected to heal in time increased to the size of a plum and attracted the patient's attention. On September 21st, he applied for re-examination, and on inspection the swelling was found to be a pulsating tumor of a dark-red colour sitting on the radial artery. Although the skin was not movable, it yet could be pinched up; no thrill was felt, but synchronously with pulsation a murmur was audible. On pressure being given to the upper course of the artery, the pulsation stopped at once; and when the injured hand was lowered, the superficial veins in the neighbourhood of the tumor became engorged, accompanied by a tense swelling of the hand and dulness of sensation in the thumb. This was accordingly diagnosed to be a case of traumatic aneurism of the radial artery, and, on October 3rd, the patient was sent to the *Kobe Maru*. On examination in the ship, a walnut-sized round tumor, soft and elastic, was found at the upper part of the lower one-third of the left forearm. It had a marked pulsation, an arterial murmur could be heard, and along the course of the artery a pain was complained of. There was no adhesion, except a slight one at the base. The skin over the tumor had brown cicatrices, one of the size of a bean, and the other of a little finger tip, which revealed slight tenderness. These cicatrices were said to be

the remains of the penetration of shell-fragments. Accordingly, on the 5th, an incision, about 5 cm. long, was made in the left forearm with the tumor for its centre, and after applying ligatures to the radial artery above and below the tumor, it was removed. It was now ascertained that the tumor was of a dark-purple-green colour, and lying between the supinator longus and the tendon of the *radialis internus*, stretched over the tendon of the *flexor pollicis longus*, and adhering to the muscles, sheaths of the tendons, and veins thereabout, though there existed no communication with the veins themselves. After the operation, the wound healed by primary intention on October 17th, when the patient was returned to his ship *Mikasa*, to resume his service. His case took 41 days in running its course, and he remained in hospital for 14 days.

69. Blind Wound of the Left Forearm:—T. F., aged 18, a hired servant on the *Kasuga*. During the battle on August 10th, 1904, he was at work as an ambulance man when at 6.44 p.m. a hostile shell hit No. 2 6-inch gun and exploded. At that moment, he was injured by a shell-fragment and came to the dressing station without help. On examination, an aperture of wound 6 cm. long and 5 cm. wide, was found on the exterior side of the lower one-third of the left forearm. This wound, taking its course onwards,

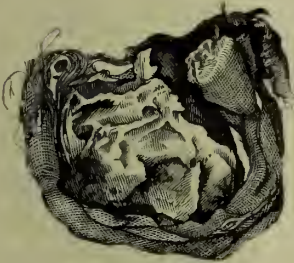


Fig. 14. Shell-fragment wrapped up in a thick layer of white garment cloth, extracted from the left forearm of the patient, case 69.

formed a wound track 7 cm. in length, between the layers of the deep and superficial muscles of the forearm, and a thick layer of white garment cloth was found driven into the wound, one end of which coming out of the aperture looked as if gauze had been stuffed into it. There was bleeding, but the radial artery seemed quite intact. Accordingly, the wound was dressed aseptically and at night when the battle came to an end, an incision was made, through which was extracted a shell-fragment, 3 cm. in length, 2.5 cm. in width, 1.7 cm. in thickness, and 18 grammes in weight,

wrapped up in the cloth piece mentioned before (see Fig. 14). Then the wound was partially sewed together, followed by due dressing, and thus the patient was, through the *Kobe Maru*, admitted into the Sasebo Naval Hospital on the 14th following. At that time, the margin of the wound was found generally swollen, and there was a discharge of thin pus. In the course of some days, however, the pus flow gradually subsided and the ulcers kept steadily growing shallower and smaller, so that, by the 13th of September, the wound surface measured but 10 cm. in length and 2.5 cm. in width. On the 15th, skin grafting was

performed, which was attended by a favourable result, and superficial cicatrization was accomplished over the whole wound, except the orifice of the fistula. By October 3rd, the fistula was also entirely closed, and the wound was at last cured leaving a mere linear cicatrix. The patient left the hospital completely cured on October 18th. His case took 69 days before recovery.

70. Contused Wound of the Back of the Right Hand, attended by Fractures of the 2nd and 3rd Metacarpal Bones:—G. O., aged 22, a leading seaman on the *Adzuma*. During the battle fought in the neighbourhood of Okinoshima on May 27th, 1905, he was, as one of the crew of No. 7 12-pounder gun, at work amidships on the port side of the upper deck, when at 2.25 p.m. he was injured by fragments of iron-plate, consequent upon the bursting of No. 7 6-inch gun. On examination, an irregular contused wound somewhat of the shape of a semi-lune and 6 cm. in length was found, extending from the radial side on the back of the base of the right index finger to the middle of the back of the hand. The periosteum of the bone was exposed at the bottom of the wound, the 2nd metacarpal bone had sustained an oblique fracture, its distal end being comminuted, and the 3rd metacarpal bone also presented a fracture a little above its middle part. The tendons of the extensor digitorum communis were severed at the middle of the wound, so that the movements of the fingers were obstructed. Accordingly, under general influence of narcotics, a couple of irregular spiral-shaped fragments of zinc'd iron-plate, found imbedded in the wound, were extracted (see Fig. 15). The patient was sent to the Sasebo Naval Hospital on



Fig. 15. Iron-plates extracted from the wound of the back of the right hand of the patient, case 70. (Actual size.) The upper smaller one is the fragment of the lower.

the 30th. That same night, under local anæsthetic, the 2nd metacarpal bone was cut off at the lower one-third. By subsequent treatment, the wound progressed favourably day by day and by June 30th, the part from which the 2nd metacarpal bone has been excised improved so auspiciously that it had now only two fistule left, one the size of a small pea and the other the size of a rice-grain, with a small cavity in the interior. In consequence, all the other fingers but the 2nd and 3rd could now perform something in the way of extension and flexion. On the 2nd of July, the patient was removed to the Maidzuru Naval Hospital. At that time, on the back of the right hand was seen a semilunar cicatrix, 5 cm. in length, with a bean-sized fistula at the middle which discharged dilute

pus. The fractured part of the 2nd metacarpal bone was swollen, owing to the growth of callus. By due treatment given at the hospital, the fistula closed and healed; however, the right index and middle fingers got stiffened in the extended position, and the two other fingers could be only slightly flexed at the 2nd phalangeal articulation, so that the right hand was deprived of its functions. Accordingly, the patient was dismissed from service for life and left the hospital on August 20th. His case took 85 days in running its course.

SECTION VII. INJURY OF THE LOWER EXTREMITY.

The cases of mortal wounds of the lower extremity numbered 46 instant deaths, 53 subsequent deaths, and 17 deaths at hospital, making up 116 cases in all. This shows a ratio of 11.89 per cent. compared with the total number of instant deaths of all kinds, a ratio of 46.49 per cent. with the total number of subsequent deaths of all kinds, a ratio of 36.17 per cent. with the total number of deaths of all kinds at hospital and a ratio of 21.16 per cent. with the total number of deaths of all kinds. In other words, injuries of the lower extremity produce a smaller proportion of instant death as compared with those sustained in other regions, while they produce a larger proportion of mortality in subsequent deaths and deaths at hospital than those caused by injuries in any other region. Deaths caused by injuries received only in the lower extremity were 9 instant, 29 subsequent, 12 in hospital, all the other cases being accompanied by mortal wounds in other regions.

The total number of cases of the injuries under consideration which survived was 763,—of which 70 were invalided, 53 returned to service after recovery from serious wounds, 239 left hospital completely recovered from slight wounds, and 401 were treated on the ships, making an aggregate of 763. To the total number of all kinds of injuries, this shows a ratio of 45.45 per cent. invalided, 40.46 per cent. returned to service after recovery from serious injuries, 30.76 per cent. of those who left hospital after recovery from slight injuries, 33.25 per cent. of treated on ships. The above bears a ratio of 33.64 per cent. to 2,268, the total number of injuries cured by treatment. From this we learn that each of the above ratios is higher than that of injuries received in other region—this being especially the case with the invalided and those who recovered from serious injuries.

The above calculation is confined to injuries received only in the lower extremity. However, if we count in those instances of injuries of the lower extremity which accompanied principal wounds in other regions such as proved either mortal or serious, we find that those of the gluteal region numbered 75, those of the thigh and knee-joint 551, those of the leg and ankle-joint 474, those of the foot 235 which make up 1,335 cases in all and include both serious and slight injuries. If we were to consider the areas of the regions mentioned above and number of injuries received we should learn that the foot and the leg are likely to sustain a comparatively larger number of injuries than the thigh and hip. This seems to show that in a naval battle both the upper and lower ends of our body, that is those parts which are situated close either to the upper or lower surface of the deck are more liable than other parts of the body to sustain a larger percentage of injury.

We shall now give statements of 9 instances of injuries of the gluteal region and thigh that occurred to the wounded on our side and on the Russian (of which one Japanese and one Russian case proved fatal in consequence of coxitis which was brought on as the result of fracture of the head of the femur); 4 instances of injuries of the knee-joint and of its neighbourhood, (one being that of a Russian seaman); 6 instances of injuries of the leg (one of which proved fatal), and 7 instances of injuries of the foot.

71. Wound attended with Loss of Soft Tissues of the Right Upper Arm; and Blind Wound of the Left Thigh, accompanied by Fracture of the Femur:—M. T., aged 21, an ordinary seaman on the *Shikishima*. During the first attack upon Port Arthur on February 9th, 1904, he stood, as an assistant signalman, on the port side of the boat deck, when at 12.30 p.m. a hostile shell hit the fore funnel and exploded. At this moment he was wounded by shell-fragments. On examination, (a) an irregular square shaped wound attended with loss of soft tissues, 12 cm. long and 11 cm. wide, involving all the layers of the triceps, was found at the lower half on the outer side of the right upper arm; (b) at 8 cm. behind and below the anterior superior spine of the left ilium, there was a round wound of entrance with a diameter of about 2.7 cm. A probe introduced into it touched the bone surface; there was considerable bleeding, and a severe pain accompanied the passive movement of the lower limb. The wounds being dressed aseptically, the patient was sent to the Sasebo Naval Hospital by the *Genkai Maru* then leaving for home, and was admitted to the hospital on the 13th following. On examination;—on the posterior-exterior side

of the right upper arm, there was found a wound attended with loss of soft tissues and of the size of both palms combined, which extended from the middle of the upper arm to immediately above the olecranon process. The muscles were crushed, and quite at the bottom, corresponding to the middle of the wound, the humerus deprived of its periosteum was exposed, though there was no fracture of the bone. Again, at 8 cm. behind and below the anterior-superior spine of the left ilium was found a round wound 4 cm. in diameter, in the blind end of which was perceived the head of the femur comminuted, and there was escape of offensive pus red-brown in colour. Accordingly, the free bone pieces were removed, followed by insertion of a drainage-tube. After the patient had been admitted into the hospital, his temperature continued at 39°C. or thereabout, and a blackish pus with offensive smell constantly escaped in copious quantities from the wound of the thigh. Accordingly, on February 20th, the inside of the wound was closely examined after enlarging it upwards and downwards, and thus there were taken out a shell-fragment 3.7 cm. long, 2 cm. wide, 1.6 cm. thick, and weighing 25.7 grammes (see Fig. 16), also, several pieces of bone. Although facility of pus escape was thus given, yet the temperature did not fall. On the 23rd, bed-sores appeared in the nates; some time afterwards several pieces of torn garment were discharged from the wound which had now formed an extensive cavity. After the 29th, coughing and expectoration supervened, blood being sometimes seen mixed in the sputum, and debility was found to increase daily. The temperature did, indeed, fall slightly on the 31st, but the pulse numbered 110 and breathing 40 or thereabout, and the patient was sinking. From about the 20th, the skin of both upper limbs, chest and abdomen began to show petechiæ; delirium occurred; the blood was found to have a marked increase of white corpuscles, and the staphylococci could be isolated from his blood. On the 22nd of March, at 1.30 p.m., the patient died of exhaustion. The days' sickness numbered 42.



Fig. 16. Iron-fragment extracted from the wound in the thigh of the patient, case 71. Actual size.

72. Lacerated Wound of the Right Lumbar Region and Perforating Wound of the Right Thigh, accompanied by Fracture of the Femur; and Abrased Wound of the Right Upper Arm:—F. R., aged 30, a Russian torpedo petty officer on the *Rurik*. During the battle of Ulsan on August 14th, 1904, he was injured, and having received first-aid from a surgeon belonging to our Second Squadron, was admitted to the Sasebo Naval Hospital on the afternoon of the 15th. On examination, there was found a lacerated wound, which, running downwards and forwards from the

lower border of the costal arch at the right lumbar region, reached 2 cm. below the crest of the ilium. The lower end of the wound changed into a canal which communicated with another aperture of wound about 2.2 cm. wide, existing at the upper one-third on the exterior side of the right thigh, and the distance between the upper border of the former wound and the latter measured 36 cm. The upper half of the lacerated wound was sutured. Besides these, in the inner side of the right upper arm there was found an abraded wound 10 cm. in length, which was deep enough at the middle to reach the subcutaneous tissue. Close examination made into the interior of the former wound showed that the right trochanter major was injured: its surface was coarse and had a defect of bone large enough to admit the tip of the index finger. Accordingly, the skin was incised upwards from the wound orifice in the thigh to a length of 12 cm., so as to reach the fractured part. The wound of the lumbar region was sutured entirely, except its lower extremity. Upon this, there occurred a profuse flow of pus, so that the bandages were soiled green, attended by a severe pain at the part. The temperature stood between 38°C. and 39°C. The appetite was dull, and there was much thirst and sleeplessness. On the 28th, under general influence of an anaesthetic, an incision was again made against the trochanter major, and the bone fragments remaining at that part were extracted. In consequence, a large part of the anatomical neck of the femur was lost and, the coarse surface of the bone being now scraped away, the bone retained their connection at that part merely by means of the remaining slender bony tissue. For several days after the operation, the pus discharge decreased, and the temperature fell considerably, but it rose again and fluctuated between 37°C. and 40°C. Symptoms of suppurative coxitis were deteriorating. Therefore, on September 7th, under influence of general anaesthetic, excision of the head of the right femur was performed, and the head of the bone, which had grown coarse owing to an extensive loss of cartilage, cut away. It was now found that a fistula, large enough to admit the head of the index finger, existed at the anterior-inferior part of the acetabulum, which ran inwards in the direction of the iliac fossa. After the operation, the temperature continued to fluctuate, at times accompanied by chill and shivering. The internal use of stimulants and injections of saline solution and camphor ether failed to have any effect, and the patient died on September 10th, at a quarter past nine at night. He received treatment for 26 days at the hospital.

73. Perforating Wound of the Left Forearm; Blind Wound of the Left Iliac Region accompanied by Fracture of the Ilium; Wound attended with Loss of Soft Tissues of the Left Thigh; and Contusion of the Right Thigh:—T. I., aged 22, an able sea-

man on board the *Mikasa*, was injured at 5.56 p.m. by a hostile shell, while at work in the aft 12-inch turret in the battle on August 10th, 1904. On examination, the following injuries were found: (a) on the anterior-exterior side of the upper one-third of the left arm, a couple of round apertures of wound, both with an equal diameter of about 2 cm., which perforated from the exterior to the interior side. (b) Midway between the anterior-superior spine and the posterior-superior spine of the left iliac crest, a blind wound, 7 cm. in length and 6 cm. in width, which ran from outside and above to inside and below and had the ilium shattered at the bottom. Out of this, several pieces of bone fragments were taken out. (c) There existed a large oblong wound, attended with loss of soft tissues, 21 cm. in length and 12 cm. in width, with the junction of the upper and middle one-thirds of the left thigh for its centre, and starting from its outer side, transversally passed the back and reached the inner side of the thigh. The deepest part of it lay on the exterior-posterior side, the depth being 5 cm., and the wound had the vastus externus, biceps femoris, semi-tendinosus and semi-membranosus exposed. (d) On the posterior surface of the upper one-third of the right thigh was a palm-sized contusion, which was found swollen and of a dark-purple hue on account of subcutaneous extravasation. On the 12th of the same month, the patient was sent home, through the *Saikio Maru*, to the Naval Hospital at Sasebo. At the hospital, under influence of general anæsthetic, the wound aperture in the iliac region was enlarged, and from it a rivet (see Fig. 17), 4.5 cm. long, 3 cm. in diameter, and 135 grammes in weight, as also some bone pieces, were extracted. As the result, the wound took a favourable course, developed firm granulation, and, subsequently forming cicatrization, was healed on the 21st of November. The surface of the wound with loss of soft tissues of the left thigh, to which skin grafting was performed on September 13th, was cured completely on October 25th. Prior to this, the perforating wound of the left forearm had healed on September 13th. The patient was again transferred to the Maidzuru Naval Hospital on the 13th of December. On inspection there, the wound of the left forearm was found already healed, and, adhering to tissues beneath, it formed an infundibular depression. The cicatrix in the left iliac region had very extensively adhered to the bone and caused a severe pain deep down. The cicatrix of the left thigh, which measured 16 cm. in length and 8 cm. in width,

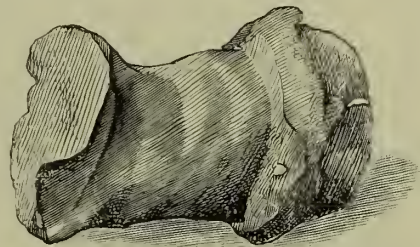


Fig. 17. Rivet extracted from the wound in the left iliac region of the patient, case 73. Actual size.

was found also to have adhered to the muscles beneath, and its surface was remarkably excavated. Therefore, active and passive movement as well as massage, hot-bath, etc., were resorted to, and the result was improvement to a large extent; but, owing to cicatricial contraction of the part, the patient was unable to sit regularly in the Japanese way or to crouch, and the left lower limb showed an atrophy and its movements were impaired, so that the patient could only walk slowly. On March 1st, 1905, he was dismissed from service for life and left the hospital. His case took 203 days in running its course. See photograph (73).

74. Wound attended with Loss of Soft Tissues of the Right Thigh; Perforating Wound of the Right Leg; Blind Wound of the Left Thigh; Contused Wound of the Back of the Left Foot; Contused Wound of the Right Middle Finger accompanied by Fracture of the 3rd Phalanx; Contused Wound of the Right Thumb; Burns of the Left Nates; Abrasions on the Right Epigastric Region, the Right Forearm and Both Legs:—K. S., aged 23, a 1st-class stoker belonging to the *Fuso*, was selected for the crew of the block-ship *Mikawa Maru*, on the third attempt of blocking the entrance to Port Arthur. At 2.50 a.m. on May 3rd, 1904, outside Port Arthur, a hostile shell struck against the starboard side of the ship, just below the No. 2 machine gun, which he was serving. The shell-splinters struck and wounded him. At 4.50 a.m., he was picked up on board No. 41 torpedo boat, and was received by the *Asama* at 5 o'clock in the morning. On examination, (a) a wound with loss of soft tissues, 17 cm. long and 8.5 cm. wide, was found running from the anterior surface of the upper part of the right thigh, past the inner side of the same, to the lower part of the tuber ischiadicum. The margin was irregular and soiled a dark colour; the superficial layers of the adductor muscles were injured, and there was a slight hæmorrhage. Also at the middle of the raphe of the scrotum, a small portion of skin was denuded. (b) At the middle of the inner side of the right leg was found a perforating wound which ran from forwards and upwards to backwards and downwards. The aperture of entrance measured 5.5 cm. in length and 2.7 cm. in width; that of exit was 3.5 cm. long, and 2 cm. wide. The gastrocnemius was perforated leaving skin, 2 cm. in width, between the two apertures. (c) At the upper part of the inner side of the left thigh was found a blind wound, 3.5 cm. in depth, taking its course forwards and downwards. (d) At the middle of the dorsal surface of the left foot lay a contused wound, which reached to the subcutaneous tissues. Both apertures of wounds (c) and (d) were of the size of a bean. (e) At the middle of the nail of the right middle finger a small wedge-shaped shell-fragment was discovered inserted, and the 3rd phalanx was fractured. (f) At the back of the 1st phalanx and on the palmar side of the distal phalanx of the right thumb, we found contused

T. I. ABLE SEAMAN. *MIKASA*. BLIND WOUND WITH FRACTURE OF THE LEFT LUMBAR REGION; WOUNDS ATTENDED WITH LOSS OF SOFT TISSUES ON THE LEFT THIGH; CONTUSED WOUND ON THE LEFT FOREARM. (73.)



K. S. STOKER. THE BLOCK SHIP, *MIKAWA MARU*. EXTENSIVE LOSS OF SOFT TISSUES OF THE RIGHT THIGH; PERFORATING WOUND OF THE RIGHT LEG. (74.)



wounds, each 1 cm. in diameter, and reaching to the subcutaneous tissues. (*g*) In the left nates there was a burn of the 1st degree, and on the right epigastric region, the right forearm and the anterior surface of both legs, abrasions were found, each the size of a 1-sen* copper piece. The shell-fragments, fibres of cloth, etc. lodging in the wounds were now extracted, followed by application of antiseptic dressings, and opium was administered internally. On the 7th, the patient was sent on board the *Saikio Maru*, whence he was transferred on the 9th to the Sasebo Naval Hospital. On examination there, as far as the wound (*a*) lying on the interior side of the right thigh was concerned, the adductors at its bottom, especially the adductor longus and gracilis, were found crushed, with tiny shell-fragments and fibres of woollen cloth sticking to them here and there. The skin lying at the middle of the lower border of the wound was partially sloughed, and there was a copious escape of pus with a bad smell. The wound (*b*) had the soleus exposed at its bottom, but the surface was fairly clean and the pus discharge scanty. As to the wound (*c*) in the left thigh the skin at the circumference was not inflamed, nor was there any remarkable pus discharge; the rest of the wounds, from (*d*) to (*g*), had favourable courses. By due treatment given, the wounds (*c*)—(*g*) were healed within a month; the wound (*b*) passed from granulation to cicatrization and was perfectly cured in July. The wound (*a*) was so steadily developing a healthy granulation, that, on May 19th, a skin grafting was made. The result was that only an irregularly triangular ulcer, 6.5 cm. long and 1.7 cm. wide was left at the middle of the wound. On and after June 21st, a fever of 39°C. or thereabout set in at intervals. On auscultation of the chest, the respiratory sound was found to be intermittent, and râle was audible in the interseapular region. The high temperature lingered for over a month. The patient had coughing and expectoration, and although no tubercle bacilli were recognized to exist in the sputum, there was albumin in the urine, and marked debility. The grafted skin consequently lacked nutrition, and a part of it disappeared. At the end of July, the temperature was completely normal and healthy granulation revived. On the 23rd of the same month, the patient was transferred to the Yokosuka Naval Hospital. At that time, his face was pale, and anæmic; the granulating surface existing at the interior and superior part of the right thigh was unfavourable, and a quantity of pus was evacuated. The patient could walk with the help of a crutch, but he complained of feebleness everywhere below the right thigh. After due treatment, the wound surface became steadily smaller and smaller, and having at last formed a complete cicatrix by September 7th, the patient was now able to use his injured limb with freedom. He was, accordingly, allowed to leave the hospital on October

* A one-sen copper piece has a diameter of about 2.7 cm.

3rd. His case took 153 days in running its course,—see photograph (74).

75. Wound attended with Loss of Soft Tissues of the Left Thigh; Blind Wound of the Right Inguinal Region; Contused Wound of the Left Leg; Contused Wound of the Right Thoracic Region; and Contused Wound of the Chin:—A. W., aged 25, a 1st-class petty officer on the *Iwate*, was wounded at 1.15 p.m. on February 9th, 1904, by indirect projectiles from a shell, which broke the stanchion of the fore bridge and exploded against the fore funnel of the ship. On examination, he was found to have (a) a wound attended with loss of soft tissues, 15 cm. long and 10 cm. wide, which extended from the middle part on the anterior side of the left thigh to the part 6 cm. above the upper border of the patella. Particles of paint, broken pieces of wood, sand-grains, etc., were found sticking to the surface of the wound. Half the layers of the quadriceps femoris were crushed, attended by more or less hæmorrhage. (b) At the outer one-third of Poupart's ligament, there existed a wound of the size of a thumb head, which took its course inwards and downwards, forming a cavity as it advanced. The spermatic cord was visible at its bottom. In the wound, were discovered an iron-fragment weighing 135 grammes (see Fig. 18) with a torn piece of clothes attaching to one end, and a couple of small pieces of wood. (c) At the upper part on the

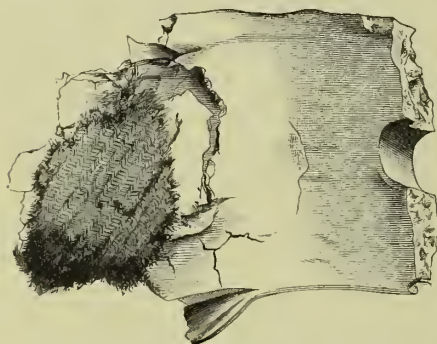


Fig. 18. Iron-fragment which inflicted the blind wound in the right inguinal region of the patient, case 75. Actual size.

anterior side of the left leg was a superficial contused wound. (d) A contusion the size of a 2-sen* copper coin was found on the right 3rd rib on the mammary line, and an iron-fragment 4 cm. long, 2 cm. wide, and 19 grammes in weight had lodged outside his shirt against the wound. (e) At the middle of the chin there was a flap wound of the size of a little finger-tip, with its base turned towards the right. The foreign bodies were now extracted from all the wounds, followed by aseptic dressing given to each

wound. From this time till the afternoon of the 10th, the next day, the temperature was normal and there was nothing specific to be perceived, but during the night a slight traumatic delirium came on; the mind was somewhat uneasy; delirious words were uttered from time to time, and besides, visual and auditory hallucination supervened. Accordingly, morphine was administered which gave him sound sleep for the first time. On the next morning, the symptoms had subsided, and the same day he was sent to the Sasebo Naval Hospital by the

* A 2-sen copper coin has a diameter of about 3.1 cm.

Genkai Maru just leaving for home. On the 13th, he was admitted to the hospital. At that time, the wounds (a) and (b) had a slight discharge of pus. Each wound was now treated antiseptically, and subsequently the wound (c) healed by primary intention, the wounds (b), (c) and (d) healed in succession before March 15th. The wound (a), however, presented an extensive ulcer with an cretastic and easily bleeding granulation. Ten pieces of skin were grafted in, on March 20th, which all succeeded in accomplishing perfect adhesion; the escape of green pus gradually abated and the surface shrunk with rapidity. It was entirely covered with epithelium on June 6th. The cicatrix grew firmer and firmer, and although the affected part got slightly depressed it offered no obstacle to free movement of the lower extremity. The patient left the hospital completely recovered on August 8th. His case required 181 days in running its course.

76. Perforating Wound of the Right Thigh, accompanied by Fracture of the Femur:—S. K., aged 21, an ordinary seaman on the *Takachiho*. During the battle of Ulsan on August 14th, 1904, he was on the aft lower deck employed in hoisting ammunition, when, at 9.37 a.m. a hostile shell pierced through the No. 1 divisional officer's cabin situated aft on the port side, and destroyed it and likewise the gunnery officer's cabin. At that moment he sustained his wounds. On examination, the mind was quite normal; the right lower limb was shortened, abducted and everted and was entirely deprived of its motile power. The anterior and posterior sides of the right thigh had each a wound, the one communicating with the other. The one on the anterior side, which was located at the junction of the middle and lower one-thirds of the thigh, measured 9 cm. in length and 4.5 cm. in width, running obliquely upwards and inwards from the exterior side of the thigh, while the other on the posterior side was 8 cm. in length and 6 cm. in breadth, running obliquely downwards and inwards from 9 cm. below the sulcus gluteus. The margins of both wounds were irregular and their environs were extensively crushed. This was especially the case with the latter wound, which had comminuted the femur in its course, and both wounds had numerous tiny wooden fragments adhering to the margins. So, the foreign bodies and bone pieces were extracted. To the posterior wound a rubber-tube was now inserted and into the anterior one gauze was stuffed, followed by application of an antiseptic dressing and splints. The patient was admitted to the Sasebo Naval Hospital on the 15th, the next day. In the course of due treatment at the hospital, the wounds gradually developed granulation and their communication became severed by October 2nd. A windowed plaster of Paris bandage was now superseded by a long thigh splint. This resulted in the union of the fractured part with the obliteration of the anterior and posterior fistule, and the pus dis-

charge entirely ceased at the same time. Thus the wound healed on March 2nd, 1905. Previous to this, from about October 20th, 1904, a slight œdema had set in down below the right thigh; on the posterior surface of the leg appeared hypæsthesia, and down below the right ankle-joint both senses of warmth and pain were almost gone; also the electro-muscular excitability was reduced. Accordingly, on November 21st of the same year, an incision was made along the course of the sciatic nerve to a length of 13 cm. downwards from the junction of the upper and middle one-thirds on the posterior side of the right thigh. Inspection thus made showed that the sciatic nerve had been rent asunder, its parted ends having been caught in the cicatricial tissues. So, the enlarged portions of both ends of the nerve being separated from the cicatrices and excised, the ends were sutured together in a right position. The operation wound healed by primary intention, and by means of electric massage and passive exercise, the function of the nerve was gradually returning, when on January 23rd, 1905, an ulcer made its appearance in the right ankle, which was painless in the beginning but gradually came to give pain. On the contrary, the tactile sensation and sense of heat of the right foot were restored gradually to a normal state. On June 6th, the patient was transferred to the Yokosuka Naval Hospital on the hospital ship *Saikio Maru*. The junction of the fracture of the right femur was found remarkably hypertrophied, the cicatrices adhered to the bone and the right lower limb was shortened by 4 cm., compared with the left one. Both knee- and ankle-joints were ankylosed and the man was discharged from service for life and left the hospital on September 15th. His case ran its course in 397 days.

77. Blind Wound of the Right Buttock; and Contused Wound of the Right Thigh:—I. K., aged 23, a midshipman on board the *Yakumo*, was on the fore-top, at the range-finder, in the first attack upon Port Arthur on February 9th, 1904, when, at 12.32 p.m., he was wounded by fragments of a shell, that exploded on the surface of the sea. On examination, (a) an oval wound 6 cm. long and 3 cm. wide, was found at 5 cm. behind and below the anterior-superior spine of the right ilium. The wound reached to the surface of the ilium, and in the wound there was discovered a small piece of torn garment, 3 cm. long and 2 cm. wide (see Fig. 19). (b) On the anterior-exterior side at the middle of the right thigh, there was an irregular round contused wound, 8 cm. in diameter. Both of the wounds mentioned above were attended with slight hæmorrhage. Accordingly, after removing foreign bodies from them, the wounds were dressed, and on the 11th the patient was sent to the Sasebo Naval Hospital on the *Genkai Maru* which was just sailing for home, and was admitted into

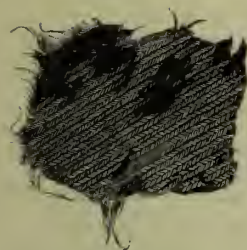


Fig. 19. Cloth piece taken from the wound in the gluteal region of the midshipman,—case 77. Actual size.



Fig. 20. Shell-fragment taken from the wound in the gluteal region of the midshipman, case 77. Actual size.

the hospital on the 13th. At that time, the wound (a) was recognized to be in a cavernous state, reaching to a depth of 7 cm., and from its bottom was extracted a rhomboidal shell-fragment (see Fig. 20), 2 cm. in length and width, 0.3 cm. in thickness, and 5 grammes in weight; also some small bits of woollen cloth. A probe introduced from the upper corner of the bottom of the wound (b) reached outside and below the trochanter major, but no foreign body was felt lodging within. At the time the patient was admitted to the hospital, both wounds evacuated quantities of pus. On March 7th, out of the bottom of the wound of the right gluteal region, a small piece of flannel was taken. After this, the healing process went on steadily; the wound cavity grew steadily less, and the escape of pus was reduced. Still, the wound of the right thigh presented no sign of cure. On March 15th, skin-grafting was performed, which proving effectual, the surface grew smaller and smaller, until it finally healed by forming a complete cicatrix. On May 26th, the patient left the hospital completely recovered. His case took 107 days in running its course.

78. Perforating Wound of the Left Shoulder; Contused Wound of the Back; Blind Wounds of the Left Upper Arm, accompanied by Fracture of the Humerus; Wound attended with Loss of Soft Tissues of the Left Thigh; Blind Wound of the Right Leg; and Contused Wound of the Sole of the Left Foot:—T. M., aged 24, a leading seaman of the *Maya*, joined the vedette-boat of the *Mikasa*, and reached outside Port Arthur on September 14th, 1904. Having fulfilled the special duty there, the boat was about to retreat, when at about 3.30 a.m., a large-calibre shell from shore-battery struck the boat and exploded. The man was wounded, picked up by the vedette-boat of the *Fuji*, and taken on board the *Chokai*. At Dalny, the same day, he was admitted on the *Kobe Maru*, where, on examination, he was recognized to have:—(a) a horse-bean-sized aperture of wound above the spine of the left scapula, which reached the supraspinatus. Again, 5 cm. above the last wound, there was found another aperture of wound the size of a sparrow's egg, which had only pierced the subcutaneous tissues. Then there was a contused wound, about 3 cm. in diameter, 6 cm. forward and downward from the inferior angle of the left scapula. (b) On the

posterior surface of the left upper arm, somewhat inclining to the interior side at its lower one-third, was found a bean-sized aperture of wound, the track of which, perforating the internal head of the triceps, took its course forward and ended blind at a depth of about 4 cm. Above the last wound was a transverse wound, about 3 cm. in length, which reached the fascia. The surrounding parts of the last two wounds were remarkably swollen to about the size of a palm, attended by extravasation; and the humerus was fractured at the lower border of the upper one-third. (c) In the left thigh could be seen an irregularly oval wound with loss of soft tissues 20 cm. long and 14 cm. wide which beginning at the middle on the posterior side, occupied the larger part of the middle one-third on the exterior side and just reached the anterior surface of the thigh. The margin was considerably crushed, and at the bottom the vastus externus of the quadriceps extensor and a part of the biceps femoris were contused and lacerated; the wound, which reached deep down into the posterior surface of the femur, had numerous black foreign bodies sticking to the bottom. (d) Just behind and below the right external malleolus there was a thumb-head-sized wound orifice. The track taking its course obliquely forward and upward, arrived at the inner side of the malleolus, where a hard foreign body was touched. (e) In the sole of the left foot, extending from the middle of the 1st metatarsal bone to the inner side of the distal end of the 1st phalanx of the great toe, there was a contused wound, 6 cm. long and 1.5 cm. wide. The margin was irregularly crushed, and although the deep part reached the ligament of the metatarso-phalangeal joint, the joint itself and its vicinity were safe. Accordingly, the aperture of each of the above wounds was enlarged and the shell-fragments lodging in it extracted, followed by the application of an aseptic dressing. On September 20th the patient was removed to the Naval Hospital at Sasebo. At the hospital, the fracture of the humerus was immobilized by a splint and some skin was grafted upon the wound (c). By these means, the fracture of the humerus formed union and most of other wounds healed by cicatrization, the only wound still remaining unhealed being one of the size of a 50-sen silver coin on the outer side of the left thigh. On December 8th, taking the good chance of the *Daito Maru* which was sailing for Maidzuru, the patient was removed to the Naval Hospital there. At the time he was admitted into the hospital, owing to an excessive growth of callus the humerus was remarkably swollen at the reunited part and the movements of the upper arm were slightly hindered. In the course of due treatment, the wound of the left thigh healed finally, and the patient left the hospital on January 21st, 1905. After his discharge he served at the Maidzuru Naval Barracks, but found it difficult to climb rigging or charge a gun, and he could show no



T. M. LEADING SEAMAN. *MAYA*. (78.)
WOUND ATTENDED WITH LOSS OF SOFT TISSUES.



S. N. ABLE SEAMAN. *YAKUMO*. (79.)
COMPOUND FRACTURE OF THE RIGHT THIGH, WITH
LARGE LOSS OF SOFT TISSUES.



activity in his other daily works. The left upper arm could not be raised higher than to a right angle with the body, nor was the flexion of the left hip-joint and the knee-joint free. Accordingly, on February 8th, he was again admitted to the Maidzuru Naval Hospital. Every measure taken there to restore the original functions of the injured limbs failed to take effect, and on May 18th, 1905, the patient was dismissed from service for life and left the hospital. His case required 246 days' treatment. Of these, 236 days were spent in hospital. See photograph (78).

79. Wound with Loss of Soft Tissues of the Right Thigh, attended by Fracture of the Femur:—S. N., aged 23, an able seaman on the *Yakumo*, was injured by a shell in the starboard 4th compartment of the main deck, at 3.40 p.m. on August 10th, 1904, in the battle of the Yellow Sea. On examination, an oval wound with loss of soft tissues 21 cm. long and 20 cm. wide, was found in the right thigh, extending below from the middle on the anterior-exterior side. At the middle of the wound, all the muscular layers on that side of the thigh were contused and lacerated: at the bottom the femur sustained an oblique and dentate fracture and the ends of the fragments laid bare. The femoral artery and vein were intact, but there was some bleeding, the surface presenting a black colour, on account of the coal dust adhering to it. After the bleeding had been stopped aseptic dressings were applied; the separated ends of the bone were reduced to their normal position, followed by the application of Liston's long thigh splint. On the 12th, he was sent to the *Saikio Maru*, whence he was, on the 14th following, transferred to the Sasebo Naval Hospital. On the day of his admission, a silver wire suture was given to the fractured part, and the thigh was duly immobilized. As the silver wire broke on August 20th, a \square shaped wedge of steel was driven in and a suture given to the part with two silver wires and a splint applied over them. Subsequently, the surface of the wound attended with loss of soft tissues developing healthy granulation became even and smooth generally. Hereupon, skin-grafting was performed, and the large ulcerous surface healed, covered with epidermis, leaving only a small fistula opposite the fractured part. However, escape of pus from the fractured part still continued. On November 13th, an incision upward and downward along the fistula, being made, a good sized piece of sequestrum, with a wedge and silver wire attaching to it, was extracted; a windowed plaster of Paris bandage and a continuous traction were applied. Some time after, the fractured part formed perfect union and the operation wound healed completely, so that the patient could walk about the room with a crutch. However, the right knee-joint got partially ankylosed. The right lower limb became shortened by 3 cm., as compared with the healthy limb. Electric massage and other measures were now resorted to. On June

8th, 1905, the man was removed to the *Saikio Maru*, whence, on the 16th following, he was again transferred to the Yokosuka Naval Hospital. The right thigh had been bequeathed a large cicatrix. The soft part at the middle of the thigh had adhered to the bone, and the bony tissues being remarkably hypertrophied, the right knee-joint and ankle-joint were obstructed in their movements. On September 16th, the patient was dismissed from service and left the hospital. His case took 402 days in running its course. See photograph (79).

80. Perforating Wounds of the Left Popliteal Region and the Right Leg:— M. O., aged 41, a signal boatswain on the *Fuji*, was wounded, on the fore bridge, by a shell which struck the stanchion of the bridge and exploded at 12. 15 p.m. on February 9th, 1904, in the first attack upon Port Arthur. On examination, he had (*a*) a perforating wound at the upper one-third of his right leg, with the aperture of entrance on the outer side, and that of exit on the inner side, of the leg. The wound track passed through the soft part in the calf, without inflicting any injury to the bones. (*b*) There was another wound of entrance on the inner side of the left popliteal region, with that of exit on the outer side. Here, also, neither the joint nor the bones seemed to have sustained any injury. The aperture of entrance of the wound (*a*) was of the size of a thumb-head, while that of exit was as large as a horse-bean. The aperture of entrance of the wound (*b*) was of a triangular shape, each side being equally 2.5 cm. in length; and the wound of exit was 4.5 cm. long and 2 cm. wide. The margins of the apertures of entrance on both legs presented a slight dark colour, those of exit being irregularly lacerated. A comparatively heavy venous hæmorrhage occurred from the wound (*b*). At the time the patient received the injuries, the mind was somewhat obscure, the face pale, the pulse weak, and the limbs cold, presenting symptoms of concussion of the brain. Accordingly, dry gauze was stuffed into the wounds, and then aseptic dressing was given, followed by hypodermic injection of ether, and both lower limbs, chest and belly were kept warm. After about 24 hours, the limbs regained their warmth, and vitality was remarkably restored. On the 11th, the patient was sent to the Sasebo Naval Hospital by the *Genkai Maru*, which was just returning home. On the 13th, he was admitted to the hospital. On examination, both wounds were found to discharge brownish pus with an offensive smell. The left leg was wholly mortified below the knee-joint and presented a reddish green colour; the skin-warmth was low; vesicles were formed in the area extending from over the internal malleolus to the tendo Achillis. In general, the signs of severe anæmia, and exhaustion of strength, were so serious that an operation could not be performed with safety. Stimulants were given to resotre nutrition,

but every endeavour failed, and the patient died at 5.55 a.m. on the 14th. His case took 5 days in running its course.

51. Wound attended with Loss of Soft Tissues in the Left Popliteal Region, accompanied by Fracture of the Femur and Tibia; Blind Wound and Contused Wound of the Left Thigh; Wound attended with Loss of Soft Tissues of the Right Leg, accompanied by Fracture of the Tibia; Blind Wound of the Nape of the Neck, and Abrased Wounds of the Right Scapular Region:—K. N., aged 25, a leading seaman on the *Idzumo*. During the naval engagement fought in the vicinity of Okinoshima on May 27th, 1905, he was at work as a member of No. 5 6-inch gun crew on the upper deck, when, at 2.27 p.m., a hostile shell pierced the hammock-netting on the starboard side of the ship and burst. By fragments of that shell he was injured. On examination, he was found to have (a) a wound attended with loss of soft tissues 12 cm. in longitudinal diameter and 8.5 cm. in transversal diameter in the left popliteal region. The middle of it went deeply into the joint; the interior and exterior condyles of the femur and the posterior surface of the head of the tibia were found partially broken, attended by bleeding. (b) At the middle one-third on the posterior-exterior side of the left thigh existed an aperture of entrance 2.5 cm. in length and 2 cm. in width, which led into a blind canal 10 cm. in length, running from the lower angle of the wound outwards and downwards, along beneath the skin, and a small nodule was felt at its bottom. (c) At the lower one-third on the posterior-interior side of the left thigh lay an oval contused wound 2.5 cm. in longitudinal diameter and 3 cm. in transversal diameter, which reached the superficial fascia. (d) Close by the popliteal fossa on the back of the right leg, existed a wound attended with loss of soft tissues 6 cm. in longitudinal diameter and 7 cm. in transversal diameter, the depth of which at the middle was 4 cm. At a little distance from the wound, outside, there was another wound, a small one, the size of a thumb-head. Between these two wounds lay a bridge-shaped piece of skin, 3 cm. in width, under which the wounds communicated with each other. A part of the tibia was found fractured. (e) At the right side hair margin of the nape existed a blind wound with an aperture 2 cm. in diameter, which went to the depth of 8 cm. forwards and outwards and had tiny pieces of torn garment lodging within. (f) An abraded wound, of the size of a 50-sen silver coin, at the middle of the upper part of the right scapular region. When the patient was taken into the dressing station, profuse bleeding had already taken place, the limbs were cold, the pulse so fine and frequent that it could not be felt by touch, and there were symptoms of acute anemia. First the bleeding was arrested; then the neighbourhood and the surface of the wounds

were cleansed, followed by application of aseptic dressing and injection of camphorated ether. Then, after some 500 grammes of physiological saline solution had been hypodermically injected, the patient was ordered rest. In the morning of the 28th (the next day), the vomiting had stopped, the appetite revived, and the pulse restored to its normal state. There was, however, still some slight bleeding, so the wound was again examined and the bleeding stopped. On the 30th, the patient was admitted to the Sasebo Naval Hospital. There an examination was made of the left knee-joint, and it was found that the femur had a long fissured fracture in its shaft, and although the upper extremity of the tibia was comminuted and scarcely held in place by the periosteum covering the part, yet many of the bone fragments were entirely detached and filled the cavity of the joint. The wound (*d*) of the right lower limb was also recognized to be serious too, though much less so than that on the left lower limb. Out of the wound (*d*), the free bone fragments were extracted; from the wound (*e*), a shell-fragment, and from other wounds torn pieces of garment; then each wound was treated antiseptically, and both lower extremities were immobilized by splints. Thus the patient was ordered to rest. The temperature, which indicated 37.7°C. before admission to the hospital, rose to 38.2° C. on the day of admission, and after that it fluctuated between 38°C. and 40°C. in the course of the day. The left knee-joint got swollen and painful; the lower part of the left thigh presented fluctuation and the leg was in general œdematous with pus flowing out of it. On June 23rd, the left thigh was amputated at the middle part, when it was discovered that, the cartilage of the joint being absent, the bone surface was coarse; that the outer condyle had lost its exterior half; and that the soft tissues had several suppurating foci formed in them. All the other wounds were also found suppurating, but as a consequence of the operation, the temperature fell to normal; or all the symptoms were greatly reduced, and the patient no longer complained of distress. On the 27th, pus escaped slightly from the end of the operation wound, which increased on the 29th. The temperature fluctuated between 37°C. and 37.4°C. till June 7th, during which time two or three wound surfaces healed. The sutured wound of the left thigh presented favourable sign of healing by primary intention. Suddenly, on July 8th, the temperature rose to 38.7°C., after which time the fever became intermittent and remittent, the body at the same time growing cachectic, and the face haggard and ghastly, with cold perspiration. The abdominal region was depressed, and still constipated; the pulse beat 120, the respiration, 24; there was coughing and expectoration, and the râle was audible in the chest. The blood test showed that hæmoglobin was reduced to half its normal quantity, that

white corpuscles had increased so that they now bore a proportion of 1 to 200 of the red, and the blood contained poikilocytes. A microscopical examination showed no presence of bacilli in the blood and the cultivation ended in a negative result; albumin was found in urine, and, general symptoms deteriorating, the patient became somnolent. At this stage, the discharge from the wound surface was not so copious, and prostration was constantly increasing. Accordingly, on July 19th, besides the stimulants, hypodermic injection of physiological saline solution was performed. The mental state remained sound till the last moment, the answers he gave, in a low voice, were always to the point; and, without falling into a comatose condition, the patient expired at 7.40 a.m. on the 21st of July. His case took 55 days in running its course.

On the 21st, at one o'clock in the afternoon, an autopsy was held, and it was found that, around the amputated end of the left femur, a callus had already grown, and that the muscles were atrophied, deficient in blood and presenting an œdematous condition. On opening the hip-joint it was seen that the muscles were partly sloughed, and that the head of the femur, with the compact substance of its shaft, was spongy, the surface being dirty and of a gray colour. The marrow of the femur was found entirely affected by suppurative inflammation. The surface of the lungs was bespattered with wedge-shaped bleeding spots, and in the upper and lower lobes of the right lung, there were suppurating foci of the size either of a small pea or of a walnut. The left lung was similarly changed. On the surface of the pleura, extending from the 3rd to the 5th intercostal space, were perceived numerous small white patches, the size of pins; the spleen was twice its ordinary size, with numberless small yellow suppurating foci in the substance, also with wedge-shaped bleeding spots, as in the lungs. The liver was rather swollen and the kidneys were engorged.

82. Blind Wound of the Right Knee-joint; Abrasion of the Calf of the Right Leg; Contused Wounds on the Face, the Right Breast, and the Left Patellar Region:—S. T., aged 39, Commander of the *Adzuma*, was wounded on the after-bridge of the ship, in the battle of the Sea of Japan, on May 27th, 1905, when at 2.52 p.m., a shell exploded against the upper part of No. 7 6-inch gun casemate. On examination, a round aperture of wound 2.5 cm. in diameter was found at the upper part of the interior margin of the right patella. The wound canal taking its course outward, upward, and backward, proceeded over the upper margin of the patella and reached a depth of about 5 cm., and, moreover, on the calf of the right leg there was a slight abrasion. The root of the nose, the right breast, the middle of the left patella each had a small

shell-fragment wound of the size of a rice-grain. Aseptic dressing having been given to the wounds, the patient was sent to the Sasebo Naval Hospital on the 30th. At that time, on the anterior-interior side of the left knee-joint was found a wound of the size of a thumb-head, the outer half of the patella was comminuted, and the vicinity of the wound was reddened and swollen, so that the part was bigger by 2.5 cm. in circumference than the corresponding part of the healthy leg. It caused pain on pressure, but there seemed to be no injury inside the joint. The X-ray examination revealed the existence of a bean-sized iron-fragment midway between skin and bone at the lower one-fourth of the anterior-exterior side of the right thigh. Strict care was taken for asepsis, and no sign of suppuration presented itself. On June 8th, the patient was removed to the *Saikio Maru*. At that time, pain was felt at the right knee-joint, and out of the wound cloud serum was evacuated. A rough surface of the patella was felt at 3 cm. outwards and downwards of the wound orifice, out of which pus escaped on pressure, and the surroundings of the joint were oedematous in general. At that stage the temperature rose to 38.5°C. The patient was transferred to the Yokosuka Naval Hospital on the 13th. Examination made at the hospital showed that the right knee-joint was bent to 165° and extension proved to be very painful. Compared with the healthy leg, the upper part of the injured leg was expanded by 1 cm. and the lower part by 3 cm. The wound discharged yellow pus in a large quantity, and outside and above the same joint existed a swelling of the size of a hen's egg, which presented fluctuation; and this part, on pressure, evacuated yellow pus mixed with some blood from the aperture of the wound. Accordingly, on the 14th of the same month, the interior of the wound on the inner side of the knee was sounded with a finger, which showed that a part of the patella was broken to several pieces and the wound communicated with the swelling mentioned before. A transversal incision of 6 cm. was, therefore, given to the skin on the anterior surface of the knee, from which were extracted several fragments of the bone. Against the swollen part mentioned before, a longitudinal incision 5.5 cm. long was made; also, another longitudinal incision, about 5 cm. in length, was given downwards from the lower end of the outer side of the knee-joint, so that the cavities of the two wounds might have communication. Then, some 20 grammes of iodoform glycerine, were poured in the wounds. After this treatment, the discharge of pus diminished, the healing process went on smoothly, and the wounds healed completely in the beginning of September leaving a partial ankylosis of the right knee-joint behind. The patient left the hospital in a convalescent state on September 18th. His case required 114 days in running its course.

83. Blind Wound of the Right Knee-joint, accompanied by Injury of the Femur and Tibia; and Perforating Wound of the Left Forearm:—V. B., a Russian able seaman on the *Rurik*, had been injured on board the ship in the Battle of Ulsan on August 14th, 1904, and after having received first-aid from a surgeon belonging to our Second Squadron, was admitted to the Sasebo Naval Hospital in the afternoon of the 15th following. On examination, he was found to have (*a*) a horse-bean-sized wound at about 3 fingers' breadth above the superior margin of the left patella and on the line vertically drawn to the inner margin of the bone. It had penetrated into the cavity of the joint. (*b*) At a part 4 cm. inwards from the olecranon process of the left elbow-joint, there were a wound about 2 cm. wide and 3 cm. downwards from the left cubital fossa, a similar wound, communicating with each other through the muscles. The skin around the wounds—especially, on its anterior-inferior margin—was affected with extravasation. On the 16th, in the afternoon, wound (*a*) was enlarged downwards by a length of about 15 cm., thus the upper extremity of the tibia being reached, a shell-fragment of the size of a little finger-tip imbedded in the bone substance about 1 cm. downwards from the articular surface of the bone, was removed. This shell-fragment had certainly penetrated the tibia, after having perforated the interior condyle of the femur. Again, a longitudinal incision 3 cm. in length was made on the outer side of the knee-joint, and thus the inside of the wound was cleansed, followed by the introduction of a drainage-tube. Subsequently, wound (*b*) healed about 3 weeks later, while wound (*a*) at first discharged copious pus, and the surrounding part got swollen considerably. Measured at the upper and lower borders of the patella, the circumference was found to be thicker by 6 cm. than that on the healthy side. However, from about the 24th, the swelling was gradually subsiding, so that by the 28th the difference in the circumferences was reduced to 4 cm. After admission to the hospital, coughing and expectoration supervened, which, however, disappeared by the end of September. By October 10th, the wound orifice had markedly contracted and the pain at the knee-joint was almost gone, so that the patient was able to walk about his room supported by a crutch. The temperature at first fluctuated between 37.5°C. and 38.5°C.; for some days after September 8th, it wavered between 37°C. and 38°C. and on and after the 23rd, it registered almost normal. The wound (*a*) healed on November 28th by cicatrization, but a slight swelling had been bequeathed to the joint, and it could not be bent more than 130°. On December 17th, he was transferred to the Prisoners' Quarters at Matsuyama. Days' treatment at the hospital was 124.

84. Burns of the Scalp and Face; Perforating Wound of the Face, attended with Fracture of the Malar Bone and the Upper Maxillary Bone; Wound attended with Loss of Soft Tissues of the Left Thigh; Contused Wound of the Left Leg, accompanied by Fracture of the Tibia; and Mutilation of the Right First Metatarsal Bone: T. S., aged 28, a 2nd class petty officer on the *Hatsuse*, was wounded at his post by the starboard No. 19 12-pounder gun on the main deck, on February 9th, 1904, in the first attack upon Port Arthur, when at 12.26 p.m. a hostile shell exploded in the admiral's cabin. On examination, (a) the scalp and face were found to have sustained burns of the 1st and 2nd degrees. (b) At the lower part of the left malar bone lay a wound orifice, 3 cm. long and 2.5 cm. wide, which had broken through a part of the malar bone and passed into the naso-pharynx via the maxillary sinus. (c) On the posterior-exterior side of the lower half of the left thigh, there was a wound attended with loss of soft tissues the size of the palm, the semi-tendinosus, semi-membranosus, and biceps being crushed. (d) At a part 12 cm. downwards from the patella, on the anterior side of the left leg, was found a contused wound, the size of a hand-palm. The tibia was extensively smashed, the fibula on the contrary being quite intact. (e) The distal extremity of the right 1st metatarsus was comminuted, and the neighbouring tissues were seriously crushed, so that the fragments of the bone were exposed.

The margins of wounds in the soft part mentioned above were very irregular and had residues of gunpowder sticking to it; within the wound were found lodging small iron-fragment, wooden pieces, and fragments of fractured bone. Hæmorrhage was comparatively slight. The patient also complained of pain in the anterior thoracic region, which was increased by the respiratory movement, but no objective symptom could be recognized. All foreign bodies were now extracted from the wounds in which they could be found, and aseptic dressings were applied. A splint was applied to the left lower limb and vaseline to the burns. Speaking about his own condition, when he had received injuries, the patient said:—"I lost my consciousness for a moment, but speedily coming to myself, I found I was bleeding from my nose and my breath on the verge of stopping. I made a vigorous strain and the breath became free at once. At that instant, owing to the smoke, it was pitch-dark all about, and though I tried to get up in the darkness, I could not. Soon after, I was conveyed to the dressing station."

That same night, the dressings were changed, and on the next day, that is, the 10th, in the afternoon, amputation was performed at the upper part of his left leg. Then the 1st metatarsus of the right foot was resected at the middle, followed by a partial suture of the part. Subsequently, the burns on the face were healed; the pain in the chest was somewhat relieved, but thin blood was

still found mixed in the sputum. On the 11th, the patient was sent to the Sasebo Naval Hospital on the *Genkai Maru*, which was just starting for home. On the 13th, he was received at the hospital. Here, each wound was found affected with slight marginal inflammation, though it had not yet gone so far as to discharge pus. However, three days afterwards, wounds (b), (c), (e) and amputated end of the left leg became to evacuate foul pus having an offensive smell. The temperature continued between 39°C. and 40°C., and debility became serious; subsequently the mind grew obscure, and the wounds of the left lower limb becoming gangrenous, the patient fell into a comatose condition, and died at 9 p.m. on the 19th. His case took 10 days in running its course.

S5. Mutilation of the Right Leg; and Wound attended with Loss of Soft Tissues of the Left Leg:—S. O., aged 20, an able seaman on the *Asama*. During the battle in the neighbourhood of Okinoshima on May 27th, 1905, he was at work as one of the crew to No. 7 light gun on the aft poop-deck, when at 3.10 p.m., he was injured by fragments of a hostile shell. On examination, the right leg had its entire soft tissues sharply cut off at the lower one-fourth, a mere slip of skin remaining intact on the back side, holding connection with the upper part; both the tibia and fibula sustained oblique fracture, and there was pretty bleeding. (In a mutilated wound, the skin remaining at the injured part is, as a rule, longer than other hard and soft tissues, and the tissues of the wound surface are rugged and unequal in length. Such an instance as the present case is indeed one very rarely met with—compiler.) Next, on the dorsal side of the left leg, at 2 cm. right above the ankle-joint existed an irregular square wound attended with loss of soft tissues, 7 cm. in longitudinal and 6 cm. in transversal diameter, which broke off the tendo Achillis and reached the periosteum, where it found bottom. The connecting skin of the right leg mentioned above was accordingly cut off, and a compress was applied. On the 30th, the patient was sent to the Maidzuru Naval Hospital, and that night, amputation was performed at the part 16.5 cm. above the mutilated wound of the right leg. Thus the wound healed by primary intention. As regards the wound attended with loss of soft tissues of the left leg, it took a favourable course from the moment of the patient's admission to the hospital, and the wound surface gradually becoming smaller, it healed completely by the middle of October. However, the stump of the right leg, after having once healed, produced afresh a number of fistule, which united, finally changing to an ulcer. The healing process in this case went on very slowly, and the wound was not cured until January 9th, 1906. Some time after that, he was able to walk with the aid of an artificial leg, and was dismissed from service for life, leaving the hospital on February 3rd, the same

year. His case required 252 days in running its course.

S6. Blind Wound of the Calf of the Right Leg ; Blind Wounds behind the Left Ear and of the Left Cheek:—H. I., aged 44, Captain of the *Mikasa*. During the naval engagement off Shan-tung Promontory on August 10th, 1904, he was on the fore compass-bridge and, at 6.30 p.m., was wounded by a hostile shell which struck the semaphore at the left end of the fore bridge. That is, the shell-fragments which had struck the compass-bridge, as it lay to the right and upwards from the said semaphore, pierced through the canvas covering the bridge and shattered the brass railing, at the same moment injuring 4 persons seriously and 1 person slightly. The captain himself was one. He sustained a blind wound with an aperture, the size of a horse-bean, in the calf of the right leg, and small blind wounds, behind the left ear and in the left cheek. After receiving temporary dressing, he resumed the command of the ship which was still engaged in fighting. At 10 o'clock at night, he received first-aid relief from a surgeon on board the ship, and at 2 o'clock in the morning, he was treated at the operating room. At that time, the blind wound of the calf of the right leg was found to have a smooth and even margin, perforating the gastrocnemius and soleus, and stopping in the soft tissues. It was suspected that some foreign body was lodging in the wound, though it could not be sounded at the time, but out of the blind wounds behind the left ear and in the left cheek, brass fragments were extracted. Then each wound was dealt with aseptically and the healing progressed without suppuration. He continued to receive treatment on board the ship, and his wounds were healed on September 14th. After that, however, pain was felt at the lower part of the cicatrix in the calf of the right leg, so that he was apt slightly to drag the injured leg. Even the limp, however, disappeared in the course of time. One day he happened to jump into a boat from the gangway ladder ; the act caused a slight recurrence of the pain, which, however, disappeared in about a fortnight. The existence of a foreign body being proved by the X-ray examination, however, the patient was sent to the Kure Naval Hospital on January 3rd, 1905. At the time of his admission, the pain was said to be felt in the deep at about 12 cm. below the head of the right fibula. Inspection by X-rays revealed the existence of a foreign body lodging between the tibia and fibula. Therefore, on the 4th, the next day, an incision of 10 cm. was given to the skin at the part under question, and by cutting into the cicatricial tissues, the foreign body was reached. Out of the indurated capsular cicatrix a brass-fragment, 11.5 millimetres in length, 9.5 millimetres in width, 0.9 millimetres in thickness, and 2.531 grammes in weight, was extracted. Suture was then given to the part, and the wound healed by primary



Z. K. LEADING SEAMAN. *IDZUMI*. COMPOUND FRACTURE OF
THE LEFT LEG, WITH LOSS OF SOFT TISSUES. (87.)

intention. On the 17th, he left the hospital completely cured. His case took 160 days in running its course. He stayed 14 days at the hospital.

87. Contused Wound of the Left Buccal Region; Blind Wound of the Right Upper Arm, attended by Comminuted Fracture of the Humerus; Contused Wound of the Left Forearm; Wound attended with Loss of Soft Tissues of the Left Leg; Contused Wound of the Left Leg, accompanied by Fracture of the Tibia and Fibula; and Blind Wound of the Left Leg:—Z. K., aged 24, a leading seaman belonging to the *Idzumi*, the captain of the No. 2 47-mm. gun, was wounded in the naval engagement near Okinoshima on May 27th, 1905, when, at 4.35 p.m., a 15-cm. gun had been blown up by a hostile shell. On examination, he was found to have sustained (*a*) a pea-sized wound at 2 cm. outward from the left angle of the mouth; (*b*) a wound, 1.5 cm. in longitudinal and 2 cm. in transversal diameter, at the middle of the anterior side of the right forearm, which, taking its course backwards and upwards, had its bottom at a depth of 5 cm., where the comminuted part of the humerus could be sounded; (*c*) a pea-sized contused wound at the lower extremity of the left forearm; (*d*) a wound with loss of soft tissues, irregularly round in shape, 9 cm. in longitudinal, and 11 cm. in transversal diameter, at the middle of the inner side of the left leg. The skin and subcutaneous tissues were lost, the muscles exposed, and the margins of the wound were irregular. (*e*) A wound, 1.5 cm. in longitudinal and 2 cm. in transverse diameter at the middle of the outer side of the same leg, which pierced beneath the skin forwards and downwards to a length of 4 cm.; (*f*) a wound, 10 cm. in length and 2 cm. in width, which ran forwards and backwards right above the internal malleolus of the left foot. The wound had an irregular margin and reached the bone in depth, the lower extremity of the tibia and a part of the astragalus were recognized to be comminuted. All the wounds were attended with pretty copious bleeding, which was arrested first of all, followed by antiseptic dressing. On the 29th, the patient was admitted into the Takeshiki Sick Quarters. At the Sick Quarters, the wound (*f*) was sutured, bringing the skin around it closer together so as to cover the surface, after a couple of the separated fragments of bone had been taken out. On the 30th, the patient was removed to the *Kobe Maru*, whence on June 2nd he was again transferred to the Kure Naval Hospital. At that time, the wound (*a*) of the left buccal region and the wound (*c*) at the lower extremity of the left forearm had already formed scabs; the right upper arm was seen generally flushing and swollen; the blind wound on its inner side evacuated pus in a slight quantity; signs of fracture of the humerus existed, but the arm was not shortened; a hard foreign body was felt beneath the skin at the upper one-third of the back of the (right) upper arm; the surface of the wound (*d*) had sloughs here and

there, was dirty and discharging the profuse pus. The compound fracture above the internal malleolus of the leg, wound (*f*), had begun to suppurate, and the skin previously sutured had not united; numerous free fragments of bone were retained in the wound, and a part of the edge of the wound was sloughing. Accordingly, several pieces of the separated fragments of bone were now removed, followed by antiseptic dressing. Subsequently, each wound began to take a favourable course and the discharge of pus abated considerably. The X-ray examination of the right upper arm on the 20th following, disclosed that the humerus was fractured into numerous pieces, large and small, at its upper one-third, and that a shell-fragment lay inserted at a part obliquely upward and outward from the aperture of entrance. Accordingly, the part was incised, and an iron-fragment (see Fig. 21), 2.3 cm. in length, 0.8 cm. in width, and 10 grammes in weight was extracted, and the injured limb was immobilized with felt. Consequently, both apertures of the wound closed. The fractured part of the humerus accomplished union with no discharge of sequestrum, and the granulating surface healed by scabbing. On the wound (*d*) on the inner side of the left leg, a healthy granulation developed, and commencing cicatrization from the margin, it was healed in September. Wound (*e*) had healed previous to this. The wound (*f*) sent out many sequestra at various times, and the severed end of the tibia protruding out of the wound, the margin was heavily inflamed. The wound (*f*) unexpectedly opened communication under the skin with the wound (*d*) and pus accumulating there, greatly retarded the process of healing. An incision was therefore given to the swollen part, and the pus drawn. The ulcerous surface produced in wound (*f*), however, still evacuated pus in a large quantity and was very painful. On July 31st, with the help of the X-rays, the existence of foreign bodies deep down in the wound was ascertained. On August 4th, an incision was made on the anterior side of the ankle-joint, and a part of the tibia deprived of the periosteum, was trephined away. Out of the aperture thus made in the bone was extracted a copper nail, 2.4 cm. long, 0.9 cm. in diameter, and 2 grammes in weight; also from the anterior surface at the lower extremity of the fibula was removed a copper bolt 1 cm. in length, 0.8 cm. in diameter, and 1.1 grammes in weight (see Fig. 22), the sequestra being scraped away. Then the skin being sutured, iodoform gauze was introduced there. On the 13th, that portion of the upper fragment of the fractured tibia which was protruding out of the wound, was removed. After that, these wounds progressed favourably, and their granu-

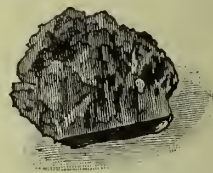


Fig. 21. Iron-fragment extracted from the blind wound of the right upper arm of the patient—case 87. Actual size.



Z. K. LEADING SEAMAN. *IDZUMI*. RADIOGRAPH. FRACTURE OF
THE RIGHT HUMERUS. (87.)





RADIOGRAPH. COMPOUND FRACTURE OF THE
LEFT LEG. (87.)



lating surface formed scars on September 16th. Massage was also given to the upper and lower injured limbs, for the purpose of working away the stiffness caused by disuse and atrophy. In October, a swelling showed itself on the internal side of the left ankle, which, however, subsided after a time. Suppuration occurred again at the part towards the end of November. This was met by a fresh incision given to the part, and in the course of successive treatment, the patient at last became able to hobble for a few steps without the help of a cane. Indeed, all the wounds were now healed as stated above, but the right upper arm had become atrophied; grasping power and movement were alike impaired and the ankle-joint had stiffened at an angle of 90°, so that the patient was unable to stand on tiptoe with the injured limb. For these reasons, he was dismissed from service and left the hospital on March 13th, 1906. His case took 211 days in running its course. See photographs (87).



Fig. 22. Copper nail and copper bolt, extracted from the wounds in the left leg of the patient—case 87. Actual size.

88. Contused Wound of the Right Leg, attended with Fracture of the Tibia:— U. M., aged 23, a 1st-class stoker belonging to the *Banjo*. On May 3rd, 1904, as one of the crew of the block ship *Edo Maru* in the 3rd blocking expedition, he was posted at the Nordenföhl gun on the port side. When the ship was sinking, orders were given for everyone to retire, and he was descending from the bridge, when (at about 3.50 a.m.) he was injured by a shell-fragment. At 5.10 a.m., he was picked up by the torpedo boat *Chidori*, and at 8.35 a.m., removed to the *Asama*. On examination, on the anterior side of the right leg was found an oval wound, 8 cm. long and 4.7 cm. wide, running upward from a point 5 cm. above the external malleolus. The tendon of the extensor longus digitorum was severed; the tibia had sustained an oblique fracture, running from inward and upward to outward and downward, at the juncture of the middle and lower one-third. Besides, a portion of the lower fragment of the bone was comminuted, attended by pain and bleeding. Six separated fragments of the bone being extracted, sterilized gauze was put into the wound, followed by aseptic dressing and application of splints. On the 5th, a large quantity of serous pus escaped from the wound, and the bandage was removed for the wound to be re-examined. At the time, it presented a dark colour, and emitted an offensive smell, and there was hæmorrhage from the bone marrow. On the next day (the 6th), a heavy swelling set in, which extended from the ankle-joint, all over the back of the foot, the discolouration reaching to the heel. The temperature had risen a little. On the 7th, the patient was sent to

the *Saikio Maru*, and was transported to the Sasebo Naval Hospital on the 9th. At that time, the right leg was found generally swollen, and was of a yellow hue, especially in the lower half. Offensive pus was discharged from the wound, and its margin had the sloughs. By the X-ray examination, it was ascertained that, between two fragments of the bone, there remained inserted a small triangular separated piece of the bone. This, however, we left as it was. From about the 13th, the inflammation began to subside, granulation improved, and the fractured ends accomplished a perfect union, together with the intruding bone-fragment mentioned above. On July 11th, the wound healed entirely by cicatrization. After this, against the atrophy of the injured limb, and the rigidity of the right ankle-joint, massage was given to the leg, and a foot-bath was ordered. By these measures, the patient recovered completely and left the hospital on the 27th of September. His case took 147 days in running its course. See photograph (88).

S9. Contused Wound of the Left Ankle-joint, accompanied by Fracture of the Left Tibia and Fibula:—K. U., aged 21, an able seaman on the *Mikasa*. In the battle of the Japan Sea, on May 27th, 1905, he was injured in the casemate of the starboard No. 7 6-inch gun on the main deck, when, at 2.20 p.m., a hostile shell perforated the ship's side just below the net-rack below the said casemate, entered the coal-bunker and exploded, shattering the casemate and the deck. On examination, on the inner side of the left ankle-joint was found a sideways contused wound, 8 cm. in length and 3 cm. in width, which laid bare the tibia and smashed a part of the internal malleolus. The fragments of the bone were extracted from the wound, and at the same time a part of the end of the bone being resected, antiseptic dressing was applied to the injured spot. On the 30th, the patient was sent to the Sasebo Naval Hospital. At that time, the left ankle-joint was generally swollen and red, attended with severe pain. The lower part of the leg, and the dorsal side of the foot, were heavily œdematous. The temperature indicated 39.3°C. On June 6th, under general anaesthetic, two longitudinal incisions upward and downward were given to the outer side of the left ankle. Examination of the interior now made, showed that the tissues within the joint were considerably damaged and presented signs of suppurative inflammation, but no change was found in the tarsi; the lower extremity of the fibula had sustained oblique fracture; and several fragments of the bone were recognized as lodging in the wound. Therefore, after removing these, a part of the tibia was sawed off, and the limb immobilized with a splint. After this operation, the discharge of pus became profuse and there was a tendency for the pus to accumulate. The swelling steadily progressed, so that now it extended to the



U. M. STOKER. BLOCK SHIP *YEDO MARU*. COMPOUND FRACTURE
OF THE RIGHT LEG. (88.)



RADIOGRAPH FOR THE ABOVE. (88.)



lower one-third of the leg. Hereupon, the aperture of the wound was enlarged and a drainage tube introduced. The temperature, after this, began gradually to fall; the discharge of pus decreased, and by the end of July the fistula had closed, and, the granulation gradually contracting, the patient was able to walk with the help of a cane at the end of September. About the 15th of the same month, however, fistulae were produced again in the cicatrised parts of the internal and the external malleoli. On October 11th, a small fragment of sequestrum was discharged from the fistula on the outer side, and again on December 15th, a somewhat larger piece of sequestrum from that on the inner side. In February, 1906, the inner side got considerably swollen, attended by fluctuation. So, under general anæsthetic, a part of the lower end of the tibia was removed. On March 10th, the fluctuation again appeared just above the part mentioned above. This was met by a fresh incision, and sanious pus was discharged. Subsequently, the fistula closed entirely; the granulation by degrees formed a cicatrix, and thus the wound was healed on April 12th, leaving behind an ankylosis of the left ankle-joint and the shortening of the injured limb by 2.5 cm. On May 21st, the patient was dismissed from service for life and left the hospital. His case took 359 days in running its course.

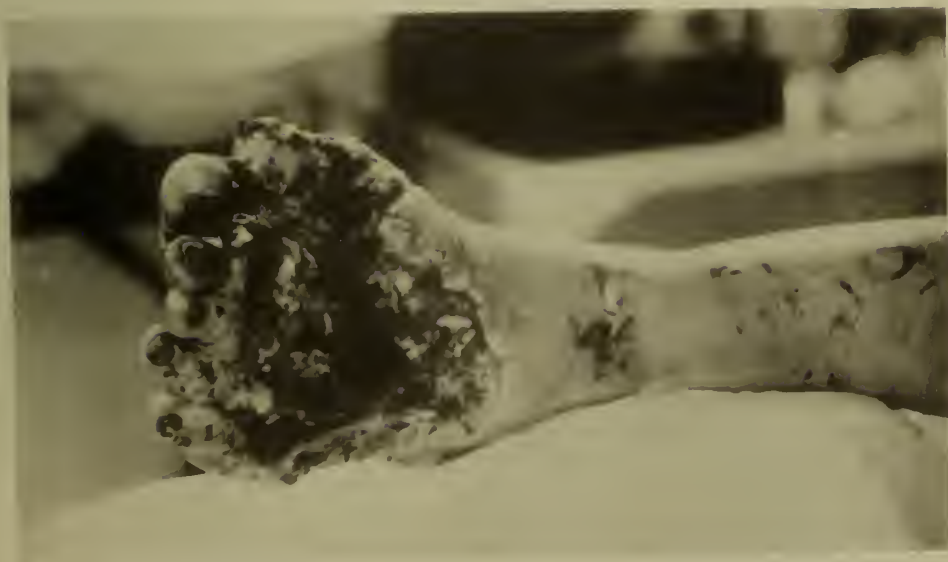
90. Contused and Lacerated Wound of the Back of the Left Foot; Contusions of Both Thighs and of the Left Leg; Contused Wound of the Left Index Finger; and Abrased Wound of the Right Buccal Region:—K.W., aged 21, an able seaman on the *Nissin*. In the battle on August 10th, 1904, he was engaged in conveying ammunition amidships on the upper deck, when a 6-inch shell penetrated into the base of the main mast without exploding after having perforated the netting at the middle part. He was injured in both lower limbs and in the fingers of the left hand by the splinters. On examination, he was found to have the following wounds:—(a) At the region extending from the first phalanges of the toes on the back of the left foot to the region 3 cm. forward and downward of the left ankle-joint, a lacerated wound disclosing the bones at the bottom; the tendons of the muscles of the superficial and the deep layers on the dorsum of the foot and a part of the metatarsal bones were injured; on the sole there was a contused and lacerated gutter wound, 8 cm. in length, and running backwards and outwards from the interphalangeal space of the first and second toes; the wound reached to the bone, and partly mutilated the great toe at that point. (b) There was an extravasation extending from the inner side of the left thigh to the knee-joint. (c) At the middle of the anterior surface of the left tibia, there was an abrasion the size of a 2-sen copper-piece. At the anterior side of the left leg there also existed many ecchymoses with irregular shapes, and the size of a broad

bean or a little finger-tip. (*d*) At the middle of the inner side of the right thigh there was an extensive extravasation. (*e*) On the backs of the 2nd phalanges of the middle, ring, and small fingers of the left hand there existed contused wounds corresponding in size to the fingers. (*f*) At the right buccal region existed an abrasion of the size of a 50-*sen* silver coin. The same night a severe pain declared itself in the wounds (*a*) of the left foot. The countenance became pale, the pulse faint, and there was occasional delirium. The wounds were, however, on a fair way towards recovery. On the 12th following, the patient was sent to the *Saikio Maru*, from which he was admitted into the Sasebo Naval Hospital on the 14th. At that time, the wound on the back of the left foot was covered with slough of a dirty blue colour and the œdema spread over the left leg, followed by a severe pain. The temperature indicated 38.7°C. As there was no hope of preserving the left foot, an amputation was performed at the upper one-third of the left leg on August 15th. From that time, the temperature returned to normal and the outer half of the operation wound healed by primary intention, while the inner half formed only a superficial ulcer after the removal of sutures. On September 10th, the patient was transferred to the Yakosuka Naval Hospital. At that time the stump still had a small superficial ulcer, which completely had healed by October 3rd, and an artificial leg was fitted to the stump. The patient left the hospital on November 16th, dismissed from service. His course, from first to last, took 98 days. See photograph (90).

91. The Right Foot Blown off; and Contused Wound of the Left Great Toe:— T. H., aged 24, an able seaman on board the *Nissin*, was wounded from the same cause and at the same instant, as Case 90 just described. On examination, his right foot was blown off, everything before the scaphoid bone and other tarsi, the articular surfaces of these bones being exposed. The irregularly severed ends of various tissues were hanging, some long and some short, from the wound. Moreover, the nail of the left great toe had been torn loose and there existed swelling and extravasation. At the time when he was wounded, he was much excited, and complained of pain in the locality injured. On board the ship, an antiseptic dressing was applied and he was admitted into the Sasebo Naval Hospital on August 14th, through the *Saikio Maru*. At that time, the wounds were covered with sloughs of a dark indigo colour, the pus discharged had an offensive smell, and the temperature was remittent. On the 15th following, the right leg was amputated at the lower one-third; after that time the healing was going on favourably, and by September 12th, the operation wound had completely healed, while a new growth of the nail had set in at the left great toe. On September 14th, the patient was transferred to the Maizuru Naval Hospi-



S. O. ABLE SEAMAN. ASAMA. RIGHT LEG
BLOWN OFF. (85.)



K. W. ABLE SEAMAN. NISSHIN. CONTUSED WOUND ON THE
BACK OF THE LEFT FOOT. (90.)



tal, when the stump had already healed wholly, and formed a complete cicatrix, though the extremity of the wound was still a little swollen with slight anæsthesia. Protective dressing was applied and quiet rest was ordered. As soon as the symptoms above mentioned had disappeared, an artificial leg was supplied. He was invalided from service and left the hospital on December 10th. His case ran its course in 122 days. See photograph (91).

92. Contused Wound of the Right Leg, attended by Fracture of the Tibia; Perforating Wound of the Lower Lip; Blind Wound in the Sole of the Right Foot, accompanied by Comminuted Fracture of the Os Calcis:—C.T., aged 39, a second class petty officer on the *Asama*, was wounded at his post in the captain's cabin on May 27th, 1905, in the battle of the Japan Sea, when a shell exploded into the lower deck at 3 p.m. On examination, it was found that (a) the upper part of the right leg was generally swollen, partly owing to an extensive subcutaneous extravasation. At the inner surface of the upper one-fourth of it there was a bean-sized aperture of wound. An abnormal movement and severe pain were also found below the tubercle of the tibia. (b) In the lower lip, 1 cm. to the left from the median line, there was a wound, 5 cm. long and 2 cm. wide; the lip was perforated and the right central incisor of the upper jaw had been dislocated outward, the left one of the lower jaw inward; and two small contused wounds besides were found in the lips. (c) At the inner side of the calcaneal region on the sole of the right foot we found a red-bean-sized opening, and the part was contused and swollen. Gauze was inserted through the apertures of all the wounds, an aseptic dressing given, and the patient admitted to the Maizuru Naval Hospital on the 30th, following. At that time, the part from the right knee-joint to the sole and back of the foot downward was highly œdematous, presenting ecchymoses here and there; when the neck of the left tibia was touched, the patient complained of severe pain, and blood clot filled the wound (b); and some wooden splinters were found in the wound. The part around the wound (c) was examined by the X-rays, and the existence of comminuted fracture of the os calcis was ascertained. Then antiseptic dressings were applied to all the wounds, followed by the application of splints to both legs, and rest was ordered. Thus wound (b) healed in the middle of July. As to the wound (a) accompanying the fracture of the right tibia, the aperture closed up within a month, and at the region corresponding to the internal condyle of the tibia, an eminence owing to the hypertrophied bone tissue was felt; but neither abnormality in the joint nor overlapping of the fragments of the fractured tibia could be found. The healing process went on without any complication, the swelling reduced spontaneously, the extravasated blood

was gradually absorbed and the wound completely healed about December of the same year, though leaving partial ankylosis in the knee-joint. The wound (*c*) suppurated a few days after injury, evacuated copious quantities of pus with offensive smell, and the whole foot became much swollen. A counter-opening was therefore made, on the right side of the sole, to facilitate the discharge of pus. After this, the swelling abated very much, but as the discharge of fetid pus did not stop, the aperture of the wound was enlarged on September 9th, and the separated pieces of the bone were extracted. Then, at last, the wound closed, in the beginning of December. At a region, however, 6 cm. below the right internal malleolus, a fluctuation was discerned, which changed into a fistula, as the result of the evacuation of pus after the incision. At the bottom of the fistula, 4 cm. deep down, a rough surface of bone was discernible. On February 20th, 1906, this part was scooped by a sharp spoon, followed by the insertion of iodoform gauze, and the patient was ordered to take rest. While the treatment was going on, cellulitis occurred as a complication on the back of the foot, and an incision became inevitable. On April 5th, the cellulitis healed. The fistula on the sole also gradually closed, and completely healed on May 10th. As a consequence, however, of way in which the wounds had healed, the upper extremity of the right tibia presented a marked hypertrophy, while the right knee and ankle-joint remained partially stiffened; the movement of the metatarso-phalangeal articulations was also incomplete. The right lower limb remained shorter than the left by 4 cm. and remarkably atrophied, so that the patient was unable to walk. He was dismissed from service, and left the hospital, on August 3rd, 1906. The days' sickness was 433.

93. Blind Wound of the Left Foot, attended by Comminuted Fracture of the First Metatarsal Bone:—M. S., aged 21, an ordinary seaman on the *Kasuga*. In the battle off Shan-tung promontory, on August 10th, 1904, he was engaged in conveying ammunition amidships on the upper deck, when, at about 7 p.m., a shell perforated the flag-locker in the vicinity of the flying bridge. A fragment struck and wounded him. On examination, there was (*a*) an aperture of wound, 4 cm. long and 3 cm. wide, at the middle part of the first metatarsal bone on the inner side of the left foot. The distal half of the first metatarsal bone was comminuted at the bottom of the wound, and the track ended blind 4 cm. down from its aperture. On the 12th following, the patient was admitted to the *Saikio Maru*, from which he was transferred on the 14th to the Sasebo Naval Hospital. In the hospital, a foreign body was ascertained to exist at the space between the 1st and 2nd metatarsal bones, and on the 19th following, an incision 8 cm. long was given, to the space between the 1st and 2nd metatarsal bones from the



T. H. ABLE SEAMAN. *NISSHIN*. MUTILATION OF THE
RIGHT FOOT. (91.)



M. S. ORDINARY SEAMAN. *KASUGA*. BLIND WOUND WITH
FRACTURE OF THE LEFT FOOT. (93.)

sole of the foot, and a shell-fragment, 3.3 cm. in length, 1.5 cm. in width, and 13 grammes in weight (see Fig. 22), was extracted together with four separated fragments of the bone the size of a little finger tip. Then a drainage tube was introduced. The same evening, the temperature rose to 39°C. with severe pain in the back of the foot, which was reddened and much swollen, and the

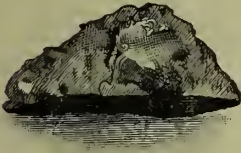


Fig. 22. A shell-fragment extracted from the wound of the patient—case 93. Actual size.

back of the foot presented symptoms of cellulitis. On the 31st following, after an incision to the space between the third and fourth metatarsal bones in the dorsum of the foot, another incision of 3 cm. long was given to the region corresponding to the calcaneo-scaphoid articulation to facilitate the discharge of pus. After this, the inflammation gradually disappeared and the operation wound, through which the shell fragment had been extracted, had closed up by September 30th, while the wound incised into the back of the foot, and the original wound at the inner side of the same, had become much contracted. Still, as there was a tendency for pus to accumulate there, the aperture was enlarged. After that, the evacuation of pus decreased suddenly, the œdema also disappeared and granulation went on favourably on each wound. On October 7th, the patient was removed to the Kure Naval Hospital. As a result of treatment given there, both the operation wounds on the back of the foot formed cicatrices on the 15th following; the original wound was also entirely cured on November 11th. The patient, however, felt pain in walking, on account of an ankylosis of the tarso-metatarsal articulations, the flexion and extension of the left ankle-joint were much limited. On the 31st of December, the patient was discharged from service for life, and left the hospital. The days' sickness was 143. Refer to photograph (93).

94. Perforating Wound on the Left Side of the Inferior Maxillary Bone; Blind Wound of the Right Heel attended by Comminuted Fracture of the Calcaneum; Contusion of the Left Leg:—S. F., aged 38, a chief petty officer belonging to Torpedo Boat No. 68 of the first flotilla. At the time of an attack upon hostile ships off Karasaki Bay, on May 28th, 1905, he was handling the wheel, and injured by the explosion of a hostile shell, which struck the fore part of the boat at 9.20 p.m. On the 28th following, the patient was admitted to the Takeshiki Sick Quarters. On examination, he was found to have (a) entrance and exit apertures of wound, both 2 cm. in diameter, perforating the soft part at the juncture of the ramus and body of the left inferior maxillary bone; (b) an aperture of a blind wound, 5 cm. long and 3.5 cm. wide, rather inclined to the outer side of the inner tubercle of the right calcaneum. The wound had its

margin introverted, the os calcis, had been smashed as deep as 5 cm., and numerous fragments of the bone together with 5 or 6 broken fragments of fenders were discovered inside. (c) On the outside of the lower one-third of the left leg, there was a palm-sized contusion with subcutaneous extravasation. Suture was tried on both apertures of the perforating wound (a) and the skin on the margin of the wound (b) was cut off, followed by an application of aseptic dressing. Wound (a) healed by primary intention, while the extravasation of wound (c) being completely absorbed, both healed in the middle of June. Afterwards from wound (b) leathery substances, supposed to be a part of the crust of the fender, were extracted plentifully, together with hemp and hemp-palm fibres, (see Fig. 24). Along with these substances, numerous separated fragments of the bone were also extracted and there was an abundant amount of pus. The wound at last formed a big cavity. Presently, a hard foreign body deeply imbedded in the bone was touched at the bottom of the wound, but it was difficult to move it. The patient was, therefore, transferred to the *Saikio Maru* to be examined by X-rays there and, as was expected, the existence of a large foreign body was ascertained. On July 11th, a skin incision of 4 cm. was given to the outer side of the calcaneum, and a part of the bone was removed. By this means, an irregular square brass plate (refer to Fig. 25), measuring 4 cm. in length, 3 cm. in width, 0.5 cm. in thickness, and 15 gram. in weight, was extracted; the incised portion healed by primary intention, the pain decreased, the temperature also fell, and granulation began to grow gradually. By August 31st, the diameter of the aperture of the wound had contracted to one cm. Still it had a depth of 5 cm. On September 1st, the patient was transferred to the Sasebo Naval Hospital, being, on the 17th, removed once more to the Yokosuka Naval Hospital. At that time, a round aperture of wound, the size of a little finger tip, existed at the exterior and anterior part of the right heel. The skin around inverted inward and the outer surface of the calcaneum was markedly swollen, attended by pain. On the 22nd following, the existence of a small iron fragment still concealed was disclosed by the X-ray apparatus, and an incision was once more given, to the part 2 cm. behind the tuberosity of the 5th metatarsal bone, and the separated fragments of the calcaneum were extracted together with a shell-fragment from the inner side of the bone. For some time

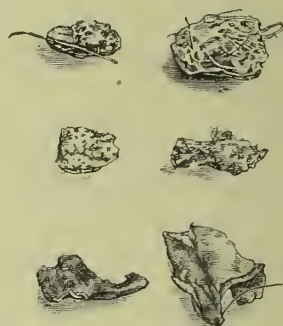


Fig. 24. The fragments of the broken fenders extracted from the wound of the right heel of the patient—case 94. The upper four represent the hemp-palm fibres, and the lower two the leathery substance. Actual size.

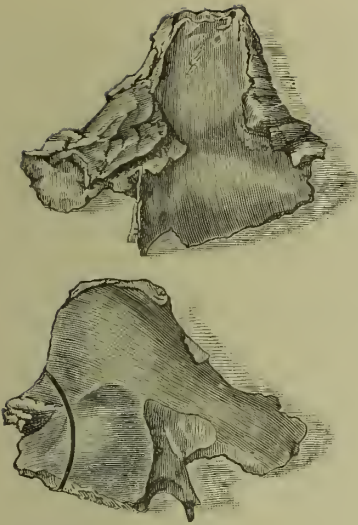


Fig. 25. The fragment of brass-plate extracted from the wound at the heel of the patient—case 94. The both aspects are shown. Actual size.

after that, the granulation went on favourably, the evacuation of pus ceased, and by the 31st, the wound had healed completely, forming a cicatrix. On January 14th, 1906, however, a part of the cicatrix swelled and broke of itself, forming a fistula attended by secretion of yellow pus. The introduction of a probe touching some coarse surface of bone, a third opening, which reached the necrosed part of the bone was made on the wound aperture on the 9th of February, and a part of the calcaneum was removed. Then the discharge of pus suddenly diminished, the granulation inside went on favourably, and the wound healed with an epidermis growing around it. The greater part of the calcaneum was however lost, leaving a big cicatrix depressed; tendons of the peroneus longus and the brevis, were involved in the cicatrix, causing ankylosis

of the ankle-joint. Walking brought on a certain pain, together with a slight degree of lameness; and as the patient could not discharge his duties, he was promoted a warrant officer on June 12th, and retired from active service, leaving the hospital on the same day. The number of days' sickness was 381 in all.

95. Contused Wound of the Right Buccal Region; Contusion of the Right Leg; Contused Wound of the Left Foot, accompanied by Fracture of the Calcaneum:— B. Y., aged 22, an able seaman belonging to the *Asama*. During the engagement in the vicinity of Okinoshima, on May 27th, 1905, he was at work in the captain's cabin as one of a gun crew to the starboard 12-pounder, when he sustained injuries from a shell discharged by the enemy. On examination, (a) a flap wound, 7 cm. long and 4 cm. wide, was found on the right buccal region, with its base upward; the surface of the wound was dirty and fine wooden pieces were sticking in the surface, while the base reached the superficial fascia. (b) The part from the knee-joint of the right leg to the upper part of the ankle-joint, was generally swollen, the outer side presenting subcutaneous extravasation, though the bones and joints were quite intact. (c) There was also an opening of wound, 15 cm. in length, which commencing at the front and upper part of the inner side of the left ankle-joint, and turning backward and downward, reached the middle of the sole, after coming to a part 3 cm. away from the internal malleolus. The upper part of the wound was somewhat shal-

low, the lower part deeper, and the soft tissues was markedly crushed. The wound reached the cavity of the calcaneo-astragaloid joint after destroying the sustentaculum tali of the calcaneum; a copious quantity of blood was flowing from the sole. The small pieces of the bone were now extracted, bleeding was arrested, together with the suture of wound (a). The patient was transferred to the Maidzuru Naval Hospital on May 30th. At that time, the wound (e) on the inner side of the left foot formed a deep cavity the size of a goose egg, and the calcaneum was comminuted, discharging an abundant quantity of pus. Antiseptic dressing was applied to the contused wounds, with a compress of carbolic acid solution to the contusion (b); but the margin of wound (a) did not form union and the discharge of pus continued without ceasing. The interior of the wounds, therefore, was closely examined on July 19th, and a wooden piece, 1.5 cm. long and 1 cm. wide was detected. After this had been extracted, the granulation became favourable, and the wound healed by forming a cicatrix, on August 5th. As to the contusion of the right leg, the swelling as well as the pain abated rapidly, and it was cured during the latter part of June. The inflammation of wound (e), however, extended to the back of the foot, and some fluctuation appeared on the external part of the ankle. Then a counter-opening was made, on June 20th, by an incision given to this part of the wound, and a drainage-tube was introduced. From that time, the swelling and pain gradually diminished, and by the beginning of September, the œdema of the foot had entirely disappeared, leaving a favourable granulation on the wound. By the latter part of the same month, the cicatrix was completely formed and the patient was able to walk with the help of a cane. On October 2nd, however, a swelling appeared again on the cicatrized part of the aperture of the former fistula, and fluctuation resulting, the pus was drawn by incision. Again, a fistula 5 cm. in depth and reaching the bone, was formed, showing no signs of speedy recovery. On November 10th, an incision was again given, to the fistula, 6 cm. forward and 3 cm. backward, the unfavourable granulation was scraped away, and the rough surface of the bone removed with a sharp spoon; but the fistula remained as it was, without closing. At that time, the pus flowing became again copious, the temperature rose, and the patient consequently lost strength day by day. On March 20th, 1906, the bone surface in the wound, and the unfavourable granulation, were again scooped off; the evacuation of pus now decreased markedly, but the fistula was still 5 cm. deep, and the amount of pus discharge increased once more from the beginning of the month of May. On the 18th of the same month, the aperture of the fistula was enlarged and the above-mentioned operation was repeated once more, the

tissues around the fistula being at the same time removed. Then the temperature returned to normal and the escape of pus abated markedly. The contused wound (a) on the face became again inflamed after once recovering, but certain foreign bodies were extracted by means of an incision on December 27th, and it healed completely on January 5th, 1907. The fistula of the left sole, however, remained in a state of incomplete cure, and the part from the knee-joint to the toes was much atrophied; a remarkable hypertrophy appearing in the bone tissue of calcaneum, and the foot changed somewhat to the shape of the talipes equino-varus. The walking of the patient was thereby much hindered. He was dismissed from service, and left the hospital on October 30th. The number of days' sickness amounted to 512.

96. Contused Wounds of the Right Heel accompanied by Fracture of the Calcaneum:—S. W., aged 22, an able seaman on the *Mikasa*. During the battle in the neighbourhood of Okinoshima, on May 27th, 1905, he was engaged in loading cartridge cases in the No. 11 starboard 6-in. gun casemate on the upper deck, when a hostile shell struck the boat-deck at 2.55 p.m. and he was injured by flying iron splinters. On examination, he was found to have an irregular transversal contused wound in the right heel, measuring 5 cm. in length and 3 cm. in width, and a portion the size of a thumb-head was destroyed in the calcaneum, producing a depression on the surface of the bone. The separated fragments of the calcaneum were extracted, and aseptic dressing given. On the 30th of the month, the patient was admitted to the Sasebo Naval Hospital. The wound of the heel gradually contracted, owing to the formation of granulation on the surface of the calcaneum, and the discharge of pus decreased. On July 2nd, he was transferred to the Maidzuru Naval Hospital. There a depressed patch of the granulation was found on the right heel, with eczema around it, but the flexion and extension at the ankle-joint was free. The wound formed a cicatrix on July 27th. However, as the callus grew excessively, a portion of the outgrowth of the bone tissue was cut away, and the skin sutured. Thus, healing by primary intention was accomplished, but the cicatrix, which had formed previously, sloughed. The sloughs were now well removed and the antiseptic method was tried. The surface of the wound went on favourably again, and was completely healed by September 12th. The patient was, however, obliged to stay some time longer in the hospital and to receive treatment, not only for the pain he felt every time he walked, but also for the eczema on the part injured. At last, these hindrances entirely disappeared, and he left the hospital on November 5th. The number of days' sickness was 162.

ERRATA.

Throughout this book, for "torpedo-destroyers" read "destroyers."

" " " for "Sudzuki" read "Suzuki."

PAGE 51, line 27-33, for "exploded" read "collided."
 " 61, line 22, for "92" read "0.92."
 " 65, line 30, for "entrance" read "entrances."
 " 70, line 17, for "shows" read "show."
 " 74, line 7, for "wells" read "Wells."
 " 88, line 4, and Page 111, line 24, for "Bezelius" read "Berzelius."
 " 93, line 22, for "Chlomite" read "chromate."
 " 95, line 28, for "spatulas" read "spatula."
 " 97, line 29, for "humorous" read "humerus."
 " 108, line 3, for "Morrhnae" read "Morrhua."
 " 118, line 1, for "retudned" read "returned."
 " 122, line 14, for "actually received" read "actually received."
 " 122, line 15, for "days" read "days."
 " 137, line 3, for "the back" read "on the back."
 " 144, line 9, for "of varying" read "varying."
 " 154, line 17, for "their" read "Their."
 " 156, Notes, line 5, for "H.H. the and Crown" read "and H.H. the Crown."
 " 176, line 19, for "large or small sized chests" read "medicine chests Nos. 1 and 2."
 " 176, line 27, for "medical chests" read "medicine chests."
 " 178, line 5, for "200 glass" read "200 grammes glass."
 " 179, line 25, for "ordinary" read "ordinarily."
 " 180, line 21, for "store" read "shore."
 " 181, line 19, for "Surgeons" read "Surgeon."
 " 182, line 13, for "werel" read "were."
 " 185, line 13, for "the party" read "the 85th party."
 " 191, line 32, for "Asashi" read "Asahi."
 " 209, line 4, for "shaku inehes" read "shaku."
 " 215, line 12, for "Saneyoshi" read "Baron Saneyoshi."
 " 220, line 4, for "the medical service had all it could do" read "the medical supply service had no more to do."
 " 224, line 14, for "5,4,7" read "5417."
 " 227, line 2, for "Instruments—Repairs" read "Instrument-repairers."
 " 243, line 8, for "nursing trained" read "nursing in the sickwards themselves and there trained."
 " 249, line 5, for "which" read "with."

PAGE 256, line 15, for "chase" read "purchase."
 " 256, line 21, for "belon—" read "belong—."
 " 267, line 9, for "Boxes for sundry" read "Boxes for sundry articles."
 " 267, line 10, for "Chemical stands articles" read "chemical stands."
 " 272, Column of Remarks, line 6, for "each 2" read "one each."
 " 273, Column of Remarks, line 26, for "ulinary" read "ulnar."
 " 323, line 9, for "troubles" read "trouble."
 " 324, line 1, for "elcan-soiled" read "clean-soiled."
 " 329, line 1, for "calm at sea as" read "calm as."
 " 336, line 11, for "was" read "were."
 " 341, line 2, for "1905" read "1904."
 " 347, Table, for "has" read "sho."
 " 351, line 31, for "dirty hard" read "dirty by hard."
 " 361, line 14, for "which" read "their ships having."
 " 373, line 32, for "Ships Office" read "Ships' Office."
 " 381, line 4, for "tims" read "time."
 " 388, line 10, for "Year 1905 as compared with the year 1903, an increase" read "Year 1905, an increase."
 " 393, first line from bottom, for "0.20" read "0.02."
 " 445, line 2, for "ships to the Asama" read "ships."
 " 465, line 1, for "and few" read "a few."
 " 470, line 29, for "reached" read "I reached."
 " 520, line 28, for "lateral" read "transversal."
 " 527, line 9, for "leaving" read "having."
 " 532, line 15, and Page 533, line 17, for "Baron Y. Saneyoshi" read "Baron Saneyoshi."
 " 537, line 30, for "provide" read "provided."
 " 538, line 1, for "wound" read "wounded."
 " 543, line 12, for "hip" read "ship."
 " 545, Column of Article, 15th line from bottom, for "tau" read "tan."
 " 554, line 10, for "war" read "was."
 " 556, line 8, for "surface" read "surfaces."
 " 608, line 24, for "Tympanic membranes" read "Labyrinths."
 " 658, line 29, for "actueness" read "acuteeness."

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